

LIBERAL LEARNING IN RESEARCH UNIVERSITIES: COURSE DISTRIBUTION
IN GENERAL EDUCATION PROGRAMS

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This study examined general education course requirements at American research universities and discusses how those requirements related to liberal learning. Ten characteristics of liberal education were identified based on a review of the literature on liberal learning, general education, and residential education.

The sample included all members of the American Association of Universities (AAU) located in the United States. Their catalogues were reviewed in order to determine the percentage of degree requirements required for the major and for courses in the natural sciences, arts and humanities, social sciences, writing and speaking, and specialized categories. The percentage of total general education requirements was also determined. The results were analyzed using statistical measures of central tendency. The institutions' mission statements were also reviewed in order to gauge their stated public commitment to liberal education.

AAU members require students to complete a broad representation of courses across all of the academic areas noted. Their total general education requirements are similar to total requirements for the major. They require the largest proportion of courses in the natural sciences, followed by the arts and humanities, social sciences, specialized

courses, and writing and speaking. The majority of courses in the specialized category are related to cultural and diversity studies.

The institutions' general education requirements strongly support the comprehensive liberal learning goal of educational breadth, and are similar to the requirements in place at liberal arts colleges, as demonstrated by other studies. Mission statements emphasize preparation for citizenship, appreciation for diversity, communication, and critical thinking. In practice, the curricular requirements emphasize quantitative reasoning, diversity, and intellectual and aesthetic growth. AAU members generally have a strong commitment to liberal education, but they favor some liberal learning components over others (e.g., quantitative reasoning versus foreign language skills), and their course requirements do not always reflect the values in their mission statements.

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I. INTRODUCTION

American liberal arts colleges claim to offer a broad education that develops students as lifelong learners, with the ability to synthesize information from a variety of disciplines, to think critically, to communicate effectively, and to participate actively in the civic life of a democracy. Research indicates that in general, these colleges deliver on that promise (Kuh and Hu, 2001; Hersh, 1997). Their curricula are ostensibly designed to facilitate this education through distribution requirements, core courses, seminars, and a commitment to liberal arts and sciences disciplines. But questions exist as to whether the curriculum is actually, or even primarily, responsible for the transforming education liberal arts colleges propound.

Cejda and Duemer (2001) studied liberal arts colleges' curricula to determine the degree to which these institutions are truly "liberal arts." After identifying core requirement types, elective percentages, and distribution percentages, they discovered that the vast majority of these colleges are not liberal arts institutions in the strict sense. Many offer pre-professional and graduate programs (Kushner, 1999), and their curricular design is built around a traditional combination of major programs and general education requirements that is not all that different from large universities.

Is the liberal arts college experience distinctive from the educational program at research universities? In order to study this question, we must first assess one variable that has been generally understood to be the primary difference between small colleges and large universities: the curriculum. A study of research university curricula that

parallels the Cejda and Duemer approach will reveal whether important variances exist. If not, then we must assume that other characteristics of the liberal arts college are responsible for the differences in learning outcomes identified by Kuh and Hu.

This study draws upon three bodies of literature: liberal education, general education, and residential learning. The liberal education literature provides a theoretical base, essentially defining the meaning of liberal education. General education scholarship is the foundation for this study's primary research question regarding curricular distribution in research universities. The literature on residential education explores the learning outcomes associated with campus size, residential nature, and out-of-class learning, in order to illuminate the question of whether curricular distinctions actually constitute the primary difference between liberal arts colleges and research universities.

The data on course distribution in the general education curriculum represents an original contribution to existing research on this subject. Before investigating this topic, it is necessary to establish the theoretical base that underlies research universities' general education curricula: that is, the definition of liberal education that led to the adoption of the distribution system. This study also includes a discussion of the findings, limitations, and implications regarding research universities' liberal education missions and general education course distribution.

II. REVIEW OF LITERATURE

A. OVERVIEW

What does it mean to be liberally educated? This question is at the heart of many college and university missions, and most institutions design their general education programs to provide well-rounded liberal educations. Many small residential colleges define themselves in terms of liberal learning, but what role does liberal education play in research universities, with their more expansive missions?

The bodies of literature reviewed in this study suggest numerous advantages associated with liberal education, drawing upon Western educational history and theory for support. They also cast a critical eye toward the various systems American colleges and universities have used, and are using, to achieve the goals of liberal education. General education curricula are closely examined in terms of philosophy and pedagogy. Residential systems and their contributions to liberal learning are considered for campuses of all types. The literature hints at connections between general education, liberal learning, and the residential experience, but it offers no comprehensive unifying theories or principles.

The literature on liberal education and general education, however, is rich in liberal learning theory, describing many attributes for which institutions of higher education strive in their curricular requirements. It is less substantial when it comes to research on the specific methods colleges and universities use to achieve their liberal education goals. Despite the fact that liberal education is an explicit part of many

research university missions, the liberal education literature is dominated by discussion of liberal arts colleges, with little attention to research university practices. In any case, a thorough understanding of liberal learning is necessary to establish the context in which research universities design and operate their general education requirements.

The review of the literature begins by exploring the meaning of liberal education, but leads into a number of sub-questions that must be considered in order to study research university general education curricula, including:

1. How is liberal education defined?
2. What is the current understanding about the value and place of liberal education in the academy?
3. What relationship exists between liberal education and general education?
4. What do we know about college and university general education requirements, especially in terms of addressing research universities' liberal education goals?
5. How do college and university missions relate to general education curricula and liberal education learning goals? How do institutions of higher education assess these learning outcomes?
6. What is the role of undergraduate education, especially liberal education, in America's research universities?

Three other topics appear with such frequency in the literature that they bear mentioning here, due to their important influence on research universities in their design of general education curricula:

7. How does the public perceive university general education programs, and what value does the public place on liberal education?

8. What is the relationship between liberal education and universities' efforts to prepare students for careers?
9. What is the relationship between residential education and liberal education? How does this relationship influence university faculties when they design general education requirements?

A review of the relevant literature reveals the theory and practice associated with these questions, and provides context for a study of general education course distribution in research universities.

B. COMPONENTS OF A LIBERAL EDUCATION

The definition of liberal education has evolved throughout the history of Western education, but for centuries the concept has been associated with preparation for citizenship. Lang (1999) writes that “the philosophy of liberal arts is the philosophy of a democratic society in which citizenship, social responsibility, and community are inseparable” (p. 140). According to Marcy (2002), “if such decisions as affairs of state are to be left directly to citizens or their elected representatives, the need for citizens to be educated assumes profound importance” (para. 3). Many theorists include preparation for participation in the civic life of a democracy among their core principles of liberal education (Astin, 1997; Boyer, 1987; Czechowski, 2003; Durden, 2003; Farnham, 1997; Gale, 2002; Hawkins, 1999; Katz, 1996; Kuh, 1999; Lanham, 1992; Levine and Cureton, 1998b; Mohrman, 1999; Schneider and Shoenberg, 1999; Smith, 1993; Toombs, Amey, and Chen, 1991; Wong, 1996). At the heart of this concept is the belief that in order to govern themselves, citizens should have broad knowledge of the liberal arts and sciences,

and should be schooled in values and moral principles. In ancient Greece, cited by many historians as the birthplace of liberal education, servants were skilled in a single technical trade, while rulers were educated in the broad array of subjects (languages, mathematics, literature, and art) necessary to understand the complexities of civilization (Kagan, 1999). As Katz (1996) puts it, the purpose of an education in the liberal arts and sciences is the “cultivation of democratic citizens” (p. 79).

American colleges and universities have embraced the liberal arts canon from the start. The American ideals of self-governance and upward mobility, combined with a university system modeled on western European higher education (Mazzoli, 2000; Westmeyer, 1997), led to a system of higher education where a liberal education is widely valued across many types of institutions. From small church-related colleges to large public research universities, the ideal of the liberally educated person has permeated the curriculum and generated countless schemes for achieving it. But the scope of human knowledge is broad and the American culture—almost by definition—rejects the concept that all citizens must conform to a single set of values. How can universities identify the knowledge base and skill set that a liberally educated person must have in light of our diversity of world views and institutional types?

Theories abound as to the core elements of a liberal education, but some principles rise above others to the level of nearly universal acceptance. These include communication skills (writing and speaking), critical thinking, and analytical reasoning. Many scholars add appreciation for diversity, enhancement of self-knowledge or identity, development of a personal code of ethics, appreciation for human creativity, and cultivation of aesthetic taste to the list (Association of American Colleges and

Universities, 1999; Bauer, Bauer, and Abraham, 2003; Cejda and Duemer, 2001; Delucchi, 1997; Gaff, 1994; Gitlin, 1998; Hagedorn, et al., 1997; Light, 2001; Menand, 1997; Pascarella and Terenzini, 1991; Ratcliff, 1997; Rothblatt, 2003; Shulman, 1997; Vincow, 1997). Curiously, developing habits of lifelong learning—a benefit commonly cited by liberal arts colleges—appears much less frequently in the literature than the characteristics listed above.

The task falls to university faculties to define the liberal learning goals of their general education programs. The Association of American Colleges (1994) offers this list as a starting point:

1. Critical and creative thinking
2. Written and oral communication
3. Quantitative reasoning
4. Understanding diversity
5. Intellectual, ethical, and aesthetic growth
6. Problem solving
7. Preparation for citizenship and social responsibility

Other characteristics of liberal education appearing prominently in the literature are:

8. Developing self-knowledge or identity (Astin, 1997; Bost, 2003; Boyer, 1987; Fellowes, 2003; Gregory, 2003; Pascarella and Terenzini, 1991; Schneider and Shoenberg, 1998)
9. Working collaboratively with others (Astin, 1997; Hersh, 1997; Hurd, 2002; Rothblatt, 2003)

10. Cultivating foreign language skills (Boyer, 1987; Lanham, 1992; Light, 2001; Ratcliff, 1997; Toombs et al., 1991)

Others argue, with less consensus, for liberal arts education that cultivates leadership, character, and integration or wholeness, or that develops habits of lifelong learning.

This taxonomy of liberal learning evokes echoes of Howard Gardner's theory of multiple intelligences. Gardner suggests that human intelligence can be described in categories that move beyond the logical-mathematical and linguistic reasoning that dominates the traditional school curriculum (Brualdi, 1996; Yekovich, 1994), and that teachers should design programs of study that enable students to exercise multiple intelligences in order to become more fully engaged with subject matter. For example, Gardner's theory of interpersonal and intrapersonal intelligences—often conflated with emotional intelligence—speaks to liberal learning goals such as developing self-knowledge or identity, working collaboratively with others, aesthetic growth, and even quantitative reasoning: “Emotions do accompany cognition, and they may well prove more salient under certain circumstances; they accompany our interactions with others, our listening to music, and our efforts to solve mathematical puzzles” (Gardner, 1999). The classical definition of liberal learning foreshadows our modern understanding of human intelligence.

The ten characteristics listed above are widely accepted as descriptive of a liberal education. Colleges and universities develop these qualities and impart this knowledge through their entire undergraduate programs, of course, but only the general education programs are required for all students, so theoretically they must contribute substantially to an institution's liberal education goals. A university's faculty members must achieve

some level of shared understanding of each area in order to design a coherent general education curriculum.

B.1. Critical and creative thinking

This characteristic appears in the literature with greater frequency than any other, although it is not defined with much specificity. In general, students should be able to gather, synthesize, and evaluate information with good judgment and in the context of a well-rounded view of the world. Pascarella and Terenzini (1991) put it this way:

These cognitive competencies and skills represent the general intellectual outcomes of college that permit individuals to process and utilize new information; . . . reason objectively and draw objective conclusions from various types of data; evaluate new ideas and techniques efficiently; become more objective about beliefs, attitudes, and values; evaluate arguments and claims critically; and make reasonable decisions in the face of imperfect information. (pp. 114-115)

Perhaps more than any other single characteristic of liberal education, this quality is the comprehensive purpose of the entire undergraduate curriculum, not just the general education program. But many theorists (among them Gitlin, 1998; Kimball, 1997; and Menand, 1997) suggest that this can be achieved to greatest effect through a general education curriculum that is designed specifically to challenge and enhance students' critical thinking capacity, rather than relying on an accidental combination of courses—few of which are designed primarily to foster critical thinking—to fulfill this end.

B.2. Written and oral communication

Benjamin and Chan (2003) emphasize that communication skills cut across academic disciplines and departments, making it a natural and prominent component of general education curricula (p. 27). Light (2001) points out that “of all the skills that students say they want to strengthen, writing is mentioned three times more than any other” (p. 54). The ability to speak and write clearly is fundamental to the definition of an educated person; in fact, breadth of knowledge is of little use—especially in preparation for citizenship and career success—if it is not combined with effective communication skills. Many institutions address this goal through required English composition and speech courses, but some scholars question whether this is the best approach (Katz, 1996).

The last decade has witnessed a trend of writing across the curriculum (Boyer, 1996). This approach has not yet become as prevalent for speaking skills, and it is a difficult proposition in any case for large universities, where class sizes can inhibit the kind of individual instruction that is ideal for teaching speaking and writing (Astin, 1993). An education in the liberal arts not only fosters effective communication by exposing students to art, literature, philosophy, and science, it also connects these communication skills to the purposes of liberal learning in the first place: preparation for effective citizenship and living a worthwhile life. In what Levine and Cureton (1998b) call the “new curriculum,” they emphasize communication skills as part of a liberal and general education that “prepare[s] current undergraduates for the life they will lead” (p. 165).

B.3. Quantitative reasoning

The literature is mixed on this topic and its place in liberal learning or the general education curriculum. A liberally educated person should be able to interpret data and make reasonable judgments based on quantitative information (Association of American Colleges and Universities, 2002) but theorists do not agree on what type of quantitative or mathematical reasoning skills an educated person should possess. Because this characteristic is in general poorly defined in the literature, it is unclear whether it is a necessary part of a general education curriculum, or whether quantitative skills should be developed in a discipline-specific way, appropriate to an individual student's major. This study will reveal what university faculty members think, at least insofar as they require quantitative reasoning courses within the general education program.

B.4. Understanding diversity

Diversity education is an example of how the meaning of liberal education is constantly evolving. Liberal learning in America has until recent years been reserved for the nation's elite (Kagan, 1999; Menand, 1997), but many scholars now emphasize the importance of liberal learning for all college students, with the understanding that appreciation for cultural diversity is essential to preparation for citizenship and leadership in our society (Bauer et al, 2003; Carnevale and Strohl, 2001; Kimball 1997). This topic extends beyond the question of what constitutes a liberal education to the issue of who should have access to it. Because many of America's most privileged youths historically attended private colleges with liberal arts missions—purportedly for assuming leadership positions in government, commerce, and the professions—a liberal education became the coin of the realm in the United States. When land-grant and research universities began

to educate a much larger proportion of the nation's populace, liberal learning continued to constitute the measure of an educated person, and general education programs were created to supplement technical and professional programs for all students. With a much more diverse population engaged in higher education of all types, the meaning of liberal learning was revised to incorporate a variety of views. Western cultural traditions courses and great books curricula were replaced by a distribution system that reflected the diversity (in terms of course options) that was appearing with ever greater frequency in the course content.

B.5. Intellectual, ethical, and aesthetic growth

It is difficult to disagree with the virtues of intellectual, ethical, and aesthetic growth, but it is also difficult to define them or assess the student learning associated with them. At the same time, they provide one of the strongest arguments for infusing a general education program with liberal arts ideals, because there is no guarantee that major programs will address features such as arts appreciation or ethical development. These are important features of a well-rounded education program precisely because they are qualities that we seek in society's leaders (at least in the cases of intellectual capacity and ethical sensibilities).

Colleges and universities have had some success in developing these qualities in their students. In a longitudinal study of college students, Kuh (1999) found that students gained in intellectual skills, personal development, and knowledge of literature and the arts during their undergraduate years. Lang (1999) expounds on the necessity for developing personal character through liberal education, arguing that "liberal arts curricula . . . [should] inculcate qualities of civic responsibility, that is, to impart the

knowledge, understanding, and ability to make thoughtful and ethical judgments of social issues” (p. 136). Public scandals in business and government have led to calls for renewed attention to ethical development among institutions of higher education. And while the subjectivity of aesthetic preferences can lead to many interpretations of this liberal learning goal, teachers and students can agree at the very least to pursue what Gitlin (1998) calls “taste for what endures” (para. 1).

B.6. Problem solving

The ultimate purpose of liberal education is to prepare students to address the world’s problems. Schneider and Shoenberg (1998) argue that “the emerging model for a contemporary liberal education takes account of the kind of world students inherit and the knowledge and skills they need to negotiate it” (p. 13). The objective of such an education, according to Boyer (1987), is to “lead to a more competent, more concerned, more complete human being” (p. 1), or in the words of Chickering and Gamson (1987), to “understand and deal intelligently with modern life” (para. 12). In theory, an education that provides broad knowledge, fosters values and ethics, and develops skills in critical areas (e.g., analytical thinking and communication) will prepare students for solving problems in their communities, workplaces, and personal lives. As Brann (1999) puts it, liberal education “has made [students] both brave and versatile in facing practical problems” (p. 156).

B.7. Preparation for citizenship and social responsibility

This characteristic is comprehensive; it encompasses and provides a rationale for all of the knowledge and skills associated with liberal education. As noted, preparation for citizenship is the oldest standard applied to liberal learning; it has been associated with

democracy throughout the history of Western culture. The challenge currently facing America's colleges and universities is to extend this franchise to a larger portion of the population than has previously been achieved in democratic societies. "Never before have societies attempted to make university and college education available to so large a percentage of their populations or to increase that percentage at so headlong a pace," writes Oakley, and this rush to provide liberal education to all undergraduates has placed a strain on general education programs, particularly at large universities (p. 283). Lanham (1992) calls this the "democratization of higher learning" (p. 34).

Despite this challenge, colleges and universities seem to be unwavering in their devotion to this principle. Carnevale and Strohl (2001) call such an education the "anchor" of American society (para. 4). Durden (2003) refers to the "citizen-leaders who possess the comprehensive knowledge and virtue needed to build a just, compassionate, economically sustainable democracy" and speaks of the "benefit to the nation when liberal education and commerce [are] equally valued and occupy common intellectual space" (p. B20). Adler (1982) places a broad education at the foundation of all of our societies' institutions, when he claims that it is necessary "for the proper working of our political institutions, for the efficiency of our industries and businesses, for the salvation of our economy, for the vitality of our culture, and for the ultimate good of our citizens as individuals" (p. 4). Liberal education is tightly correlated with American democracy and it is designed to support "one of the oldest traditions of liberal education: preparation for political leadership" (Rothblatt, 2001, p. 30).

B.8. Self knowledge and identity

This characteristic is once again a product of many factors, including the entire undergraduate curriculum, but a liberal education should be particularly aimed at achieving this goal. An important part of the reason for helping students gain a broad knowledge of the world is to assist them in understanding their place in it. This is linked closely with intellectual development, since acquiring a cogent sense of identity requires clear thinking, sound judgment, and exploration of personal values.

Schneider and Shoenberg (1998) pay close attention to this feature of liberal learning:

[Liberal education] tries to help students place and define themselves within their particular cultures and the broader society and to do so within expanding frameworks of knowledge, self-awareness, and increased capacity for reflective judgment. New courses and programs frequently invite students to reflect on their own sources of identity and values and to engage with challenging ethical, moral, and human dilemmas. New self-consciousness about heterogeneity on campus and in society is accelerating many of these trends toward clarifying and exploring value choices and positions. (p. 8)

This concept is variously referred to as self-understanding (Astin, 1997, p. 213), identity (Boyer, 1987, p. 92), knowledge of oneself (Fellowes, 2003, para. 19), self-concept (Pascarella and Terenzini, 2001, p. 26), and holism (Rothblatt, 2003, p. 24). Many of these writers link self knowledge to career aspirations, life goals, and personal values (e.g., marriage, family, religion, integrity, service). Liberal learning enhances self

knowledge by exposing students to a variety of cultures, philosophies, and modes of inquiry, and by encouraging them to consider meaningful questions about their futures.

B.9. Working collaboratively with others

As is the case with diversity, this goal is part of the emerging paradigm of liberal education. Leadership theory is increasingly emphasizing the need for a leader to be a servant, a communicator, and a team member, rather than a top-down autocrat responsible primarily for delegation and coordination. When this leadership model is merged with the liberal education agenda of political participation in a democratic society, the definition of good citizenship requires collaboration and cooperation, especially in a pluralistic society. Of course, collaboration is not limited to the citizenship aims of the liberal arts and sciences; it is also linked to intellectual discovery, knowledge of the self, and problem solving.

According to Astin (1997), working collaboratively with others enables students to become “social change agents” (p. 213). Hersh (1997) links this skill to success in the workplace, arguing that it is exactly the sort of practical skill that business leaders desire in college graduates. Of course, working with others is a skill that requires practice, not just absorption of knowledge, so this goal has implications for general education pedagogy as well as content.

B.10. Foreign language skills

Foreign language skills have been part of the liberal arts ideal for centuries, although their prominence in many general education curricula has waned in recent years. Educators originally believed that learning foreign languages trained the mind (intellectual development) and exposed students to philosophy and literature in the

language of the authors (aesthetic taste). Recently arguments for foreign language instruction have focused on appreciation of other cultures and preparation for careers in the international business community.

In a study of Harvard undergraduates, Light (2001) found that for some students, foreign language study resulted in a “personal transformation” (p. 78). They rate language classes more highly than any other group of courses, with the exception of personal tutorials. Students and alumni report that foreign language classes are “putting into practice exactly the features that students describe as most valuable for enhancing their engagement with coursework, and their learning, in *any* subject area” (Light, p. 80). These classes present an intellectual challenge and require a degree of collaboration that dovetails closely with the other aims of liberal education described here. Ratcliff (1997) emphasizes the integration of languages with knowledge and methodologies across all liberal arts and sciences, and Boyer (1987) asserts that “language, in its many manifestations, is at the heart of understanding who we are and what we might become” (p. 93). He recommends that proficiency in more than one language should be part of the general education core.

C. THE CURRENT PLACE OF LIBERAL EDUCATION IN THE ACADEMY

The liberal education ideal continues to enjoy strong support in American institutions of higher education. Despite disagreements on definitions and the challenges of incorporating liberal learning into general education curricula, scholars affirm the salutary effect of liberal education on college students and society. Much of the modern literature makes reference to the Yale statement on liberal learning coined in 1828:

The great object of a collegiate education, preparatory to the study of a profession, is to give that expansion and balance of the mental powers, those liberal and comprehensive views, and those fine proportions of character, which are not to be found in [one] whose ideas are always confined to one particular channel. (p. 6)

Rothblatt (2003) enthusiastically builds on this foundation:

No other form of education is capable of so thoroughly examining universal or even particularistic existential and moral issues. No other form of education is able to concentrate on the most important questions of how life is to be lived or how it is to be lived in relation to other lives. Liberal education offers the intellectual and emotional basis on which is constructed a capacity to make decisions. It is the means by which men and women have sought to interpret the world or to take a comprehensive view of it. (p. 15)

Wong (1996) calls liberal education “the foundation of all academic disciplines” (p. 72), while Menand (1997) claims that “a college that fulfilled all of the other purposes of higher education but that failed to provide its customers with a liberal education would be considered deficient” (p. 1). Many scholars, among them Astin (1993), Hersh (in Britz 2003), and Carnevale and Strohl (2001) affirm that a liberal education should be *sine qua non* for all undergraduates.

Despite strong support for the liberal learning ideal, the literature points to the necessity for defining liberal education more precisely. Carnochan (1995) notes that “our understanding of liberal education is not fully coherent” (p. 184), and Arnold and Civian (1997) observe that “defining what a student should know remains as elusive as ever, as

philosophical, symbolic, political, cultural, and financial factors enter the debate” (p. 23). Because of the centrality of liberal learning to the American higher education ideal, the lack of clear definition and standards represents a crisis in higher education (Greenberg 2002). Holyer (2002) points out the need for “faculty . . . to consider collectively [the] basic issue of the nature of liberal education and the outcomes desired of liberally educated persons” (para. 19).

Scholars are now striving to identify the place of liberal learning in the modern university. Carnevale and Strohl (2001) expect current demographic and economic trends to “launch a major revival of liberal arts education” (p. 3), which has “become the standard for full inclusion in the culture and economy of the twenty-first century” (p. 5). The American Association of Colleges and Universities (2002) also refers to “twenty-first century learners,” who must be “empowered through the mastery of intellectual and practical skills, informed by knowledge, and responsible for their own and society’s values” (para. 129). Liberal learning may also find relevance through pragmatic liberal education, a concept based on the usefulness of liberal arts knowledge and skills in careers and society (Kimball, 1997). This approach links John Dewey’s experiential learning philosophy to classical liberal education ideals. Adler (1982) believes that the purpose of all schooling is to produce “generally educated human beings,” for the sake of “our cultural traditions, our democratic institutions, and our individual well-being” (p. 72). Scholars must take into account not only the place of liberal learning in the university, but the university’s role in society, as they struggle to determine “the complex fate of liberal learning in an increasingly illiberal age” (Shi, 1996, p. 38).

D. LINKING LIBERAL LEARNING AND GENERAL EDUCATION

This study of liberal education in research universities uses general education programs as a measure. General education distribution requirements do not tell the whole story about how well research universities are achieving their liberal education goals, but due to the close relationship between general education programs and liberal learning, a review of general education contributes substantially to our understanding of liberal education in the research university.

Liberal education is such a prominent part of general education programs that many scholars use the terms synonymously (Boyer, 1987; Klein, 1995; Osterlind, Robinson, and Nickens 1997; Pascarella and Terenzini, 1991; Ratcliff 1997; Westmeyer, 1997; Wong, 1996). This is a function, first and foremost, of the fact that the general education program is the only element of the curriculum that is completed by all graduates, but it is also related to the nature of general education itself in American higher education. For most universities, the bulk of the general education requirements are completed in the first two years of study, when many students are exploring identity issues, which is an aim of a liberal education. Advanced disciplinary study depends on a knowledge and skill set, especially in writing, speaking, and quantitative skills, that is delivered primarily through the general education program. Other important elements of liberal education, including critical thinking, intellectual growth, problem solving, and appreciation for diversity are central to general education curricula, based on the dual principles that all students should be exposed to these ideas and that these skills are important to study in the major.

Is it necessary to distinguish between general education and liberal education? Most scholars do not think so (Hawkins, 1999). In their study of college curricula, Cejda and Duemer (2001) discovered that “the general education program . . . appears to be the primary means of accomplishing attributes related to the formal curriculum of a liberal arts college” (p. 3), and that “a considerable weight towards the ideal of a liberal arts college has been placed on the general education curriculum” (p. 20). Phillips (1995) states that “the constant thread that runs through the postwar development of state colleges and universities is pragmatic education built on the concept of ‘general education’ and designed to fulfill the goals of a liberal education” (p. 152). According to Schneider (1997), “the twentieth-century curricular programs most famously associated with the revival of liberal education have been general studies programs, rather than programs of study in specific fields” (p. 237). Rothblatt (2002) sums it up by stating that “general education will indeed be the reigning substitute for liberal education” (p. 42). There is clearly a strong enough relationship between general studies and liberal education to warrant an examination of general studies course distribution, and to link the results to universities’ achievement of liberal arts goals.

E. GENERAL EDUCATION

General education represents a massive investment of faculty time and other institutional resources, since it frequently consumes more than 40% of the curriculum (Pascarella and Terenzini, 1991; Ratcliff, Johnson, LaNasa, and Gaff, 2001). It is through general education requirements that an institution declares its values by defining what all students

should know. Some general education themes are common to many institutions, as Cejda and Duemer (2001) point out:

By far, the most common purpose [of general education] can be summarized as to produce a liberally educated person (91% of institutions), followed by to provide breadth in the educational experience (72%), and to provide a common (or coherence in the) educational experience. (p. 15)

Ratcliff et al. claim that “general education typically is the largest academic program offered by colleges and universities” (p. 5) while Benjamin and Chan (2003) observe that it “cut[s] across academic disciplines and departments” (p. 27). Surely an enterprise so central to American higher education should be carefully planned and organized to contribute substantially to overall student learning, especially in terms of liberal education.

Yet general education programs are subject to harsh criticism in the literature. Arnold and Civian (1997) claim that its effectiveness is unclear and that teaching quality is undervalued. Kagan (1999) calls general education a “chaotic cafeteria that passes for a curriculum in most American universities today” (p. 1). These problems can be attributed to “sharp disagreements over the canon within the traditional liberal arts disciplines and periodic warfare over the meaning of ‘general education’ [in] contemporary higher education” (Greenberg, 2002, para. 1). Departments frequently staff their general education requirements with adjunct faculty or graduate student instructors (Renzi and Jordan, 2003), reflecting a view of general education as a necessary responsibility—or even burden—rather than the central purpose of the university. Smith (1993) notes that “in organizational status it is accorded far less

importance than the lowliest discipline based department,” and “faculty members are seldom hired because of their understanding of or ability with reference to general education needs” (p. 248). Phillips (1995) observes that “four-year public institutions sometimes embrace and at other times barely tolerate the general education program that permits them to offer the baccalaureate to their students” (pp. 153-154). Boyer (1987) goes so far as to call general education the “neglected stepchild of the undergraduate experience” (p. 83).

Critics attribute many of the failings of general education programs to lack of coherence, where the “different courses students take, even on the same campus, are not expected to engage or build on one another” (Association of American Colleges and Universities, 2002, para. 30). General education programs “tacitly encourage students to mix and match unrelated courses, encouraging them to see these requirements as so many bureaucratic hurdles to be jumped, not as parts of a purposeful and coherent curriculum” (Shoenberg, 2000, p. 40), perpetuating a system that Brann calls an “unstable vestige of cores, distribution requirements, or freshman seminars” (p. 154). Weingartner (1992) attributes this to a system that is driven by faculty preferences for teaching particular courses, rather than student learning goals, resulting in “a bewildering array of options, from which it becomes well-nigh impossible for students to make a sensible decision” (p. 140). According to Toombs et al. (1991),

the variation [in course requirements] is so wide and so fundamental that one is led to question whether the notion of a coherent body of ‘general knowledge and skills’ that underlies much of the published discussion and private argument actually exists in any practical form. . . . As practiced in four-year institutions,

general education is more a segment of the curriculum than a fully formed intellectual construct. (pp. 110-112)

Despite the absence of a widely-shared understanding of and appreciation for general education in colleges and universities, it remains the dominant vehicle for delivering liberal education knowledge and skills. Most institutions structure this program around a distribution system, where students select from a variety of courses. This contributes to a lack of coherence, but it also avoids the pitfalls of core systems, which require strict agreement on the canon (although the core approach still has its proponents, notably Boyer, 1997; Kagan, 1999; and Menand, 1997). Astin (1993) and Ratcliff (1997) discovered that more than 90% of American institutions of higher education use the distribution system. In a meta-analysis of student learning outcomes, Pascarella and Terenzini (1991) found that the distribution system can be effective, depending on how it is structured: a group of institutions devoting an average of 46% of the required curriculum to general education with even content distribution (among communication, social science, natural science, and humanities) had gains in student learning twice as large as a group that devoted only 31% of the curriculum to general education, and where content was unevenly distributed (p. 136).

What does this mean for the student experience in general education programs? Boyer (1987) found that three-fourths of students said that general education “adds to the enrichment of other courses I have taken” and “helps prepare me for lifelong learning” (p. 85). Marchese (1998) is less sanguine about the efficacy of universities’ approach to general education:

as [students] sit through their university's 'lecture and text' survey courses, they soon learn that eight to twelve hours a week with the books is all they need for an A or B. Once set, that pattern is never broken: study hours stay flat over the four years. (p. 4)

Kuh (1999) also discovered problems, and noted that "the proportions of students reporting substantial progress in several areas traditionally considered the domain of general education (e.g., appreciation and understanding of literature, the arts, science, values development) have decreased since 1969" (p. 112). It comes as no surprise that a program that lacks a clear sense of purpose produces mixed results for students.

Reforming general education comes as no small challenge. As Gaff, Ratcliff, and Associates (1997) point out, "certainly not all knowledge, skills, and abilities available in the undergraduate curriculum can be had by all students" (p. 138). Gumpert and Snyderman (2002) classify knowledge into seven areas for the purpose of structuring a curriculum, but they also observe that any static knowledge classification scheme warrants scrutiny. Bauer et al. (2003) call for greater university-wide attention to the issue, noting that "the general education initiative is not an isolated curricular effort for which certain departments alone are responsible" (p. 23). Astin (1993) believes that "we need to rethink radically our traditional institutional approach to general education" (p. 426), a sentiment echoed by Kuh (1999), who writes that "improvement efforts must be redoubled, especially those focusing on areas considered foundational to general and liberal education" (p. 115). Arnold and Civian (1997) suggest that reform should begin with "an understandable set of goals for a general education program, one that is tied to an institution's mission and tailored to its student body" (p. 20).

F. FROM CORE REQUIREMENTS TO DISTRIBUTION

Universities' general education programs have followed, broadly speaking, a progression from uniform core requirements to the elective system that is dominant today, typically organized by the distribution system. Westemeyer (1997) organizes this evolution into three stages: the classical period (1636-1870); the industrial-professional period (1870-1960), in which the elective system emerged; and the consumer-oriented period (1960-present), in which student interest and workplace expectations play a prominent role. This progression reflects an expansion in human knowledge and dramatic increase in the percentage of the population attending college. Most college and university faculties believe that it is no longer possible to define a core curriculum that constitutes the fundamental knowledge and skills that all educated people should attain.

This progression has been anything but linear. Public pressure, university leadership, faculty philosophy, and student demand have caused various approaches to gain favor over the last century, and they continue to push the curriculum in unpredictable directions. Harvard President Charles William Eliot is generally recognized as the pioneer of the elective system, which reached its peak at Harvard in the late nineteenth century. Other institutions embraced the elective system with less enthusiasm, gradually increasing the amount of student choice in general education while retaining a strong hold on disciplinary content. This led to the development of the major as it is known today. In the mid-twentieth century, Robert Maynard Hutchins of the University of Chicago was the spokesperson for returning to the academic core with a curricular paradigm that came to be known as the great books model. He noted that "If

we can develop general education so that all advanced study will rest on a common body of knowledge, we may succeed in making our universities true communities and communities of true scholars” (p. 57). Despite strong resistance at Chicago and other selected institutions, the elective format and the major/general education division continued to gain strength, and now represents the curricular structure of more than 90% of America’s colleges and universities (Astin, 1993).

The distributional approach has been strengthened by the recognition that a core curriculum requires choices that are exclusive by nature, since there is a finite amount of courses that students can take and books that they can be expected to read in the course of a baccalaureate program. The academy has reached the long-overdue conclusion that if a liberal education is necessary for self-governance, then the substance of that education must reflect the diversity of America’s population. It must also prepare students for leadership in a world where international collaboration is the norm. Olson (2003) writes that “[the] basic function of liberal education—this ‘liberation’ that shows us where we fit in and how we get around—has a new relevance today, when the rest of the world is at our doorstep” (p. 56). This calls for continued attention to curricular requirements, as Weingartner (1992) suggests when he observes that

The received canon must be revised so as to include works that will reflect the whole of our society and recognize the significance of the role of women, of races other than white, and of classes other than ruling. Appropriate works must, therefore, be added, even though that has to be at the expense of traditional members of the canon, given that a list of books to be studied cannot be indefinitely extended. (p. 57)

At least for now, the distribution system has emerged as the approach with the greatest promise for achieving these diversity goals.

G. LIBERAL EDUCATION AND THE MISSION OF THE UNIVERSITY

Four themes emerge in the literature when it comes to college and university missions in general and liberal or general education missions in particular. First, institutions should define goals more specifically. This is challenging for general education programs, since the aims of liberal education are broad, but the goals should nevertheless be made explicit (Pike, 1992 calls this task the most difficult challenge facing many institutions). Second, American higher education as a whole is failing in this regard; their missions are vague or poorly communicated. Third, college or university missions and goals should facilitate greater integration of courses and curricular coherence. Fourth, measures should be put in place to assess whether mission-driven general education goals are actually being met.

According to Toombs et al. (1991), “the most important function a contemporary faculty community faces is the selection of what goes into the general sector of the curriculum and how the rationale for that choice is communicated” (p. 117). Cuban (2000) asserts that “you need to have a fairly clear view of where you want to end up. What kinds of knowledge, what kinds of skills, and what kind of attitude do you want your students to have when they finish with this experience?” (Teaching and Learning, para. 42). Levine and Cureton (1998a) urge universities to “be very clear about what they want to accomplish with students and dramatically reduce the laundry lists of values and goals that constitute the typical mission statement” (p. 51). Holyer (2002) and

Kimball (1997) reinforce this position, calling for a clear sense of purpose in liberal education: what Kimball calls a “sense of conviction, even rightness” (p. 52.)

America’s colleges and universities are apparently failing in this mission. Czechowski (2003) observes that “most institutions make no cogent and transparent connection between the curriculum and their stated learning outcomes” (p. 4). In a summary of a national survey of institutions of higher education, Ratcliff et. al. (2001) discovered that “leaders report a good deal of slippage in connecting learning goals to curricula and courses. Coherence remains an enticing but elusive goal at most campuses” (p. 18). Arnold and Civian (1997) studied curricula at seventy-one colleges and universities throughout New England, and reported that “when goals are sufficiently specific, they enhance coherence and integration in the . . . curriculum, but unfortunately, we found very few examples of campuses able to accomplish this feat” (p. 20). Ewell (1997) believes that institutions revise curricula without “a deep understanding of what collegiate learning really means” (para. 4).

Many scholars agree that providing greater integration and coherence in the curriculum is a fundamental remedy for this situation. “An incoherence lies at the heart of some of our fondest curricular commitments,” according to Carnochan (1995), and institutions must link courses more clearly to learning goals if they are to achieve their liberal education missions (p. 187). Cejda and Duemer (2001) and Schneider and Shoenberg (1998) also refer to coherence in the curriculum, pointing out the prevalence of specific subject matter in catalogues and courses of study, as well as the lack of evidence of similar commitment to general or liberal education. Liberal learning goals are by their nature integrative and interdependent; student learning in one goal (e.g.,

critical thinking, problem solving) can certainly influence student development in another area (self-knowledge, personal ethics). This connection, made explicit in many mission statements, is less apparent in the curriculum itself. As Weingartner (1992) puts it, “In a piecemeal way virtually all of the components of any given curriculum are related to all the others in a myriad of different ways—some of them significant, many quite trivial” (p. 156).

How are colleges and universities to assess the broad goals associated with general education? Specific ideas are in short supply in the literature, but many scholars agree that current efforts are perfunctory at best (Arnold and Civian, 1997; Ewell, 1997; Jones and Ratcliff, 1991; Kimball, 1997; Vincow, 1997). Pike (1992) administered two commercially available tests to students in general education programs, but found them to be inadequate because they were designed to respond to outside calls for accountability, rather than to measure internal educational goals (for which a generally accepted instrument has yet to be developed). Osterlind et al. (1997) report that interest in assessment has grown over the past decade, but Schneider (2002) points out that

what all this assessment effort has yet to produce . . . is tangible evidence of how well the academy is doing on the forms of liberal learning that most educational leaders still maintain provide lasting value both to individual students and to our society. (para. 7)

There is a strong relationship between university missions and liberal learning, but much progress is needed to develop coherence in liberal and general education curricula and to assess their effectiveness.

H. LIBERAL EDUCATION IN RESEARCH UNIVERSITIES

The literature is strident in its call for American higher education to renew or fulfill its commitment to liberal learning at all levels and in all types of institutions, but much of the research is focused on liberal arts colleges. There is little mention of research universities' liberal learning efforts, despite the general agreement that university graduates should be liberally educated for all of the reasons noted above. What do liberal arts scholars have to say about research universities? Are there particular features of universities that should be taken into account when designing a general education curriculum for liberal learning purposes?

Research universities generally suffer by comparison with small colleges when it comes to general education learning outcomes. In a longitudinal study of student learning, Astin (1993) discovered that:

Having a research orientation has a negative effect on student orientation of the faculty, satisfaction with faculty, leadership, public speaking skills, being elected to a student office, tutoring other students, growth in interpersonal skills, satisfaction with the overall quality of instruction and with the overall college experience, graduating with honors, college GPA, and attending recitals or concerts. (p. 338)

Kuh and Hu (2001) report that “on balance, the performance of research university students in the 1980s and the 1990s did not compare favorably with that of small liberal arts and general liberal arts students and, to a lesser extent, doctoral university students” (pp. 15-16). “All of the modern university’s structural, cultural, and economic incentives have supported research over teaching, throughout the last century,” according to Cuban

(Teaching and Learning, 2000, para. 27). Rothblatt (2003) goes one step further by referring to contemporary academic culture as inhospitable to liberal education. Perhaps this has its roots in the origin of the research university, which Menand (1997) reports “arose in response to the preeminence of scientific approaches to knowledge” (p. 16).

Reform efforts face a difficult challenge due to the nature of the university itself. Ratcliff (1997) asserts that “curricular coherence never was an expectation of an academic culture in which individual faculty decide what they wish to teach and individual students decide what lectures and seminars to attend and what they wish to learn” (p. 145). “Faculty will have to give up some old habits of thinking about their courses, most significantly the idea that they are sole *owners* of the courses they teach,” according to Schneider and Shoenberg (1998, p. 22). Bauer et al. (2003) point to the decentralized nature of the research university as the primary difficulty in reform efforts. Wong (1996) refers to the absence of a shared sense of academic culture due to the dominance of the research ethos in higher education. Whatever the barriers may be, it is clear that general education reform—difficult under any circumstances—presents a special challenge to research universities.

There is some evidence that this is primarily a structural problem. In a 1989 Carnegie Foundation for the Advancement of Teaching study, 70 percent of faculty indicated that their primary interest lay in teaching rather than research (Oakley 1992). Further, over 60 percent indicated their belief that “teaching effectiveness rather than research and publication should be the primary criterion for promotion of faculty” (p. 277). There was very little difference between the responses of the faculty members who were the most active researchers and the respondents as a whole. In other words, faculty

members place a high value on teaching and have a desire to engage students closely in their teaching and learning, but institutional structures (tenure and reward systems, responses to market forces, class sizes, etc.) inhibit them in pursuing this goal. Studies reveal that this has a measurable and pernicious effect on students' undergraduate experiences (Astin and Chang, 1995; Kuh, Pace, and Vesper, 1997; Pascarella and Terenzini, 1991).

This begs the central question of this study. Is it in fact the structure of the general education curriculum that leads to performance differences between institutional types? If universities do offer broad, coherent general education programs designed to foster liberal learning, then other institutional features (perhaps size or residential nature) account for the differences.

I. PUBLIC PERCEPTIONS OF GENERAL EDUCATION AND LIBERAL LEARNING

References to public perception abound in the liberal education literature. Public pressures have always influenced the college and university curriculum due to enrollment and career considerations. Students and their families want to ensure that their investment of time and money is worthwhile, and that they gain the knowledge and skills necessary for successful lives. Students are increasingly interested in a college education primarily for the purpose of enhancing their earning power (Astin, 1998).

According to the Annapolis Group (2002), "parents and even a number of opinion leaders outside of higher education do not have a clear understanding of the purposes and outcomes of a liberal arts education" (p. 2), a sentiment echoed by Breneman (1990) and

Hersh (1997). They also do not recognize that differences exist in the character of small colleges and public universities. In reference to parents in particular, Immerwahr and Harvey (1995) discovered that “the actual goals of education, especially a liberal arts education, were a mystery to many of them” (para. 10). Phillips (1995) writes that “in public education, the struggle to preserve a ‘liberal education’ does constitute a constant concern, given the strength of pragmatism as an organizing philosophy” and a public cultural value (p. 151). Brann (1999) calls this “an anxious preference for career preparation over liberal learning” (p. 151).

And yet the public is keenly aware of the importance of higher education in their personal lives and for the well-being of society. “At present no dimension of modern life is untouched by universities, no social or economic arena is discounted, and no aspect of social or personal development is unaffected” (Rothblatt, 2003, p. 4). Unfortunately, this is accompanied by what Oakley (1992) calls “a marked drop in the public trust and esteem extended to so many of the institutions and organizations upon which the well-being of our society depends,” including higher education (p. 269). Vincow notes that “research universities—independent and state-supported alike—have been the object of society’s severe criticism in recent years” (p. 165). This dissatisfaction with higher education, combined with the lack of understanding of the benefits of liberal education, puts pressures on universities to emphasize career preparation and discipline-specific courses of study at the expense of producing broadly-educated, well-rounded graduates. Toombs et al. (1991) liken it to a zero-sum game, where “when more general education goes in . . . something in your specialty or mine comes out” (p. 103).

J. LIBERAL EDUCATION AND CAREER PREPARATION

Two questions are prominent in the literature on liberal or general education and careers: What do business leaders want from college graduates, and how does liberal or general education provide it? Despite public perceptions of the ivory tower, American higher education has always been closely related to the country's economic needs; one need look no further than the land grant system for an example of the government's interest in the relationship between education and industry.

In a survey of business leaders, Hersh (1997) found that Chief Executive Officers sought college graduates with strong character, generalized intellectual and social skills, and a capacity for lifelong learning. Hawkins (1999) points out that “the skills developed in a liberal arts education . . . prove highly useful in a business career—in fact, it [is] just those skills [corporate recruiters are] looking for” (pp. 22-23). Kuh and Vesper (1997) report that “business leaders and other employers continue to underscore the need for undergraduates to acquire attitudes and interpersonal skills that will enable them to deal productively with conflict and work effectively in small groups with people from different backgrounds” (p. 51). The skills associated with a liberal education, including analytical thinking, communication, and problem solving (Association of American Colleges and Universities, 2002) are especially well-suited to “senior, decision-making positions” (Carnevale and Strohl, 2001, para. 9) and general professional success (Gaff, 2003).

For all of its philosophical educational benefits, many scholars point out that a liberal education is eminently practical. Katz (1998) observes that “the liberal arts seem to have become ever more practical . . . Our society needs citizens who can rapidly adapt

to the changing needs of the growth and technological development of the economy” (p. 82). Fellowes (2003), an English professor turned business executive, tells students in no uncertain terms that “the best preparation for a career [is] study in the liberal arts,” due to its emphasis on thinking clearly, organizing tasks, and communicating effectively (para. 4). Even as the nature of industry changes, “work will be like all work in that it will require, above all, not research techniques borrowed from the senior thesis, but curiosity, sympathy, flexibility, and so forth—the virtues of liberal education, not the tools of scholarly inquiry” (Menand, 1997, p. 10).

There is an obvious disconnect between the value that the public places on liberal education and the skills that employers seek. This may once again be due to higher education systems, rather than a fundamental difference in opinion between faculty and the public as to educational values and priorities. What is the content of general education programs? What are the specific learning goals? How do we measure them? Are colleges and universities communicating them effectively to students, parents, and society at large? These questions all require further research, so that we may close a perception gap that need not exist at all.

K. RESIDENTIAL LIBERAL EDUCATION

The historically strong connection between liberal learning and residential life, nurtured in the small college setting, has been challenged by the changing demographics of higher education. Many more people are going to college, and many more of them are doing so at large universities or in non-traditional settings. No matter how effective the general education program, there is a powerful distinction between research universities and

liberal arts colleges on the basis of sheer size. The benefits of residential liberal education cited by many scholars (Annapolis Group, 2002; Astin, 1993; Kuh, 1995; Vincow, 1997; Wolf, 1969) are not extended equally to all students. Research universities must proceed from the assumption that their general education curricula will achieve their liberal learning goals, since they cannot rely on the culture of a small residential setting to do so.

The connection between residential education and liberal learning does not refer specifically to living on campus. Rather, it extends to the academic climate forged on a small campus, where students have greater opportunity for out-of-class involvement, where casual meetings among students and between students and faculty are more likely to take place, and where small class sizes are more frequently the norm. References to residential education in the liberal and general education literature take all of these features into account, since the knowledge and skills associated with liberal learning are a function of many influences, not just classroom experience or campus residence.

Scholars point to numerous benefits of the residential setting in fostering liberal education. In his study of Harvard undergraduates, Light (2001) found that learning outside of classes, especially in residential settings and extracurricular activities such as the arts, is vital. When we asked students to think of a specific, critical incident or moment that had changed them profoundly, four-fifths of them chose a situation or event outside of the classroom. (p. 8)

Pascarella and Terenzini (1991) discovered that “residential institutions . . . are more likely to provide students with . . . increases in cultural and aesthetic attitudes and values; in social, political, and religious tolerance; in self-understanding and personal

independence; and in persistence and degree attainment” (p. 639). Similar results were achieved by Kuh, Hu, and Vesper (2000), Kuh, Vesper, and Krehbiel (1994), and Kuh (1995) in a series of studies demonstrating that extracurricular activities, living on campus, and informal conversations with faculty and peers improve student persistence and satisfaction. The connection between these learning outcomes and liberal education values is clear.

This benefit is in no small part associated with thematic consistency among curricular and out-of-class experiences. The stronger the connection, the more likely students are to realize gains. After controlling for other factors, Terenzini, Springer, Pascarella, and Nora (1995) discovered that students’ class-related and out-of-class experiences both made statistically significant contributions to their intellectual orientations; in other words, they are synergistically related. Kuh, Hu, and Vesper (2000) reached a similar conclusion, citing gains in both intellectual and social development. Cejda and Duemer (2001), Graubard (1999), and Wong (1996) also note the benefits of integrating the academic program with the residential setting, especially through programs that build academic components into residential life programs. Rothblatt (2003) concentrates on the serendipitous potential for liberal learning in a residential setting: “residential education is the preferred means [for liberal learning], especially within a college where close interaction is possible, where students and teachers are in proximity, and where the socializing influences of a carefully constructed environment are preeminent” (p. 25)

Residential liberal education is particularly pertinent to this study, especially if research universities’ general education curricula are discovered to be comparable to

those of liberal arts colleges in breadth, scope, and content. If research universities demonstrate inferior liberal learning gains in comparison to small colleges, and if their curricula are determined to be similar in distributional structure, then other factors must be at work, such as size and residential setting.

L. SUMMARY

Liberal education is difficult to define with precision, but the literature contains abundant theory on the meaning of liberal education and its place in the American academy. General education literature documents the connection between universities' general education curriculum and liberal education, but there is no consensus regarding best practices. The distinctions between liberal arts colleges and research universities are highlighted in studies of residential education, rather than the general education curriculum. More study is required on the purpose and structure of research universities' general education programs in order to determine the place of liberal education in the American university curriculum.

III. METHODOLOGY

A. BACKGROUND AND STATEMENT OF PROBLEM

General education curricula in research universities have been closely scrutinized and substantially revised in the last decade (Greenberg, 2002; Jones and Ratcliff, 1991; Ratcliff, Johnson, LaNasa, and Gaff, 2001). Most institutions of higher education have adopted a distribution system for their general education programs (Astin, 1993) to encourage breadth and to develop the necessary skills for students to pursue advanced studies in upper-division courses. This system permits students to choose from a variety of options in designated subject areas, such as natural sciences, arts and humanities, social sciences, and specialized requirements. In order to fulfill graduation requirements, students must demonstrate that they have completed a broad education by taking courses in diverse departments and academic divisions.

This educational breadth is one of the characteristics of liberal learning. Although colleges and universities do not achieve liberal education goals only through the general education program, their general or core curricula do provide some indication of their mission and values by reflecting what they believe is most important for all students to learn. General education also represents an effort to balance the teaching and research functions of these institutions.

A study of course distribution requirements in research universities' general education curricula contributes to our understanding of the degree to which these universities encourage liberal learning through breadth of course requirements. It also

reveals whether their distributional curricula differ greatly from liberal arts colleges or other types of institutions where research is less prominently featured in the mission. The current literature does not include a summary of the disciplinary distribution required by research universities, making it difficult to support the widely-held assertion that liberal arts colleges require greater breadth—a key component of liberal education—than do other types of institutions.

This study investigated course distribution requirements in general education programs at American research universities. General education curricula at America's leading research universities were reviewed to determine the degree to which course requirements encourage educational breadth.

B. RESEARCH QUESTIONS

This study addressed these primary questions:

1. How much disciplinary breadth do research universities require in their general education programs?
2. How do research universities distribute requirements among the natural sciences, social sciences, humanities, writing and speaking, and specialized (diversity, physical education, cultural studies) categories?
3. What proportion of baccalaureate study at research universities is composed of general education courses?
4. What proportion of baccalaureate study at research universities is composed of courses in the major?
5. Is liberal education part of research universities' missions?

C. METHOD

This study was based on an examination of research universities' catalogue descriptions of mission statements and general education course requirements. The universities' missions were reviewed to determine whether they considered liberal education to be part of their curriculum, based on a composite definition of liberal learning drawn from the theoretical literature. The universities' general education course requirements have been grouped into five categories in order to determine breadth, including:

1. Natural sciences courses (biology, chemistry, computer science, environmental science, geology, mathematics, quantitative reasoning, physics, scientific foundations, and similar courses)
2. Arts and humanities (art, history, literature, music, religion, and similar courses)
3. Social sciences (economics, education, political science, psychology, sociology, and similar courses)
4. Communication (composition, communication arts, and speech)
5. Specialized (cultural studies, diversity, foreign languages, interdisciplinary seminars, physical education)

First-year seminars were considered specialized courses, unless the course descriptions indicated an emphasis on writing or disciplinary content, in which case they were grouped with the appropriate category.

The curricula were also reviewed to determine:

1. Credits required for the baccalaureate degree
2. Percentage of courses required in general education
3. Percentage of courses required in the major

4. Percentage of courses required in the natural sciences
5. Percentage of courses required in the arts and humanities
6. Percentage of courses required in the social sciences
7. Percentage of courses required in communication
8. Percentage of courses required in specialized areas

The data was summarized through the use of arithmetic means. The research method used in this study did not call for comparing the research universities to one another, so statistical tools were used to measure central tendency, rather than to test for significance. The primary purpose of this study was to examine and report on research universities as a class, and to discuss the findings in the context of liberal and general education theory.

Many universities have general education requirements that cut across all disciplines. Where that is not the case, I used the general education requirements for students majoring in liberal arts and sciences. In cases where an institution does not have consistent general education requirements for all majors, and does not offer a major in the liberal arts and sciences, I used the general education requirements for a student majoring in English, since it is a major found at all universities included in the sample.

Systems for awarding credit vary greatly by institution. Preliminary investigation suggested that the most common system entails courses that are worth three or four credits per course, with a total graduation requirement of 120 to 128 credits. For universities with other systems, course requirements were converted based on the percentage of total credits required for graduation. For example, if 30 courses are

required for graduation, and a student is required to take two semester- or term-long English composition courses, the writing requirement translated to eight credits.

Curricular data were entered in a Microsoft Excel spreadsheet in a matrix that displayed institution, college or school, credit requirements for the major and the disciplinary areas noted above, and the percentages associated with various course requirements and total general education requirements. Data related to the mission were entered as a yes/no function indicating whether the universities strive for liberal learning, based on the liberal education definition summarized in this study's review of literature, and as a descriptive cell listing the specific liberal education attributes mentioned in the mission statement. In cases where an institution did not publish a mission statement *per se*, general institutional education objectives or the mission statement associated with the college or school in question (e.g., liberal arts and sciences) were used.

Data were analyzed using the SPSS statistics program, version 11.0. I examined measures of central tendency, including mean, median, mode, range, standard deviation, and standard error of the mean for all categories. Results were analyzed using frequency tables, scatter plots, and histograms.

D. SAMPLE

The sample was a census of the members of the Association of American Universities (AAU) located in the United States (n=60). The AAU, founded in 1900, is an association of the nation's leading research universities. This sample was selected as the ultimate example of institutions devoted to research; all of its members are clearly distinguished from liberal arts colleges by virtue of Carnegie classification (McCormick, 2003). Their

general education curricula provided one measure of how liberal education is being achieved at institutions that are not strictly liberal arts in their missions. A list of institutions in the sample is included in Appendix A.

E. DEFINITION OF TERMS

This study was based on several concepts that lack generally agreed-upon definitions, particularly liberal learning and general education. The following definitions were used for the purpose of this study:

1. Liberal education and liberal learning (used interchangeably): A concept rooted in the democratic ideal in which citizens are broadly educated in a variety of disciplines, for the purpose of participation in the civic life of a democracy. In American higher education, liberal learning has emphasized critical thinking skills and communication in addition to acquisition of knowledge in selected subjects.
2. General education: The collection of courses and credits required of all students by a college or university in order to earn the baccalaureate degree.
3. Liberal arts and liberal arts and sciences (used interchangeably): Fields of knowledge and inquiry typically defined by academic discipline, such as biology, art, German, or political science. The definition of liberal arts excludes programs of study that are pre-professional in nature, such as business, education, engineering, and nursing.
4. The natural sciences: Disciplines with a strong emphasis on quantitative reasoning and/or the physical properties of natural phenomena; examples include chemistry, computer science, geology, and mathematics.

5. The social sciences: Disciplines that emphasize human behavior and interaction with one another and the world, where modes of inquiry frequently apply the scientific method. Examples include economics, political science, psychology, and sociology.
6. Arts and humanities: Disciplines that emphasize the creative process and human expression, including the history of human expression. Examples include drama, literature, music, and religion.
7. Mission statement and mission (used interchangeably): An institution's stated reason for being and enduring goals. Some universities in the sample do not use the label "mission statement," but state their educational goals in other terms.

F. ANALYSIS

Data were aggregated and published in table form, indicating the mean percentages of course requirements in various categories (total general education requirements, major credit requirements, and requirements in each of the disciplinary categories listed above). This is a descriptive study, where the primary analysis is in the form of discussion of the results in the context of liberal education and general education theory. The answers to the research questions indicate the degree to which research universities promote liberal learning through disciplinary breadth in their general education programs. I discuss how these results illuminate the definition of liberal learning, how they are situated in the history of liberal education, and what they reveal about the place of the research university in pursuing the American educational ideal.

Liberal arts colleges distinguish themselves from other types of institutions on the basis of providing broad knowledge and skills. To the degree that this study reveals that

universities' general education programs also provide the knowledge and skills characteristic of liberal education, then liberal arts colleges and research universities should distinguish themselves from one another based on other characteristics—such as size, residential nature, or pedagogical culture—when recruiting students. In cases where the study demonstrates that research universities' general education programs do not provide such breadth, then they are failing to fulfill their missions to educate a citizenry prepared for democratic leadership. Because strong connections are made in the literature to institutional size and residential nature and their influence on liberal learning in both liberal arts colleges and research universities, the discussion includes an exploration of this topic in light of this study's findings.

The analysis also discusses implications for practitioners, including those involved with general education reform and those responsible for institutional planning and marketing. Because this study examines just one potential distinction among institutional types—general education breadth—the results point the way to other methods for fostering liberal learning in the university setting, including opportunities for further study.

IV. RESULTS

The results provided information about university mission statements, major and general education requirements, and academic program areas, including natural sciences, arts and humanities, social sciences, writing and speech, and specialized requirements.

A. MISSION STATEMENTS

The most surprising result was the prevalence of liberal education in the missions of America's leading research universities. Of the 60 AAU members located in the United States, only two—Massachusetts Institute of Technology and The Ohio State University—do not include a specific reference to liberal learning or to components of liberal education in their missions. All of the universities prominently mention research, but in many cases liberal education is also at the foreground. In the cases of institutions that have not published formal mission statements, liberal education components appear in their educational objectives or in the missions of their colleges of liberal arts and sciences (or their counterparts).

Nearly a third include a specific reference to liberal education in their mission statements, including such diverse institutions as Brandeis, Duke, Northwestern, New York University, and the Universities of Illinois, Rochester, and Virginia. In several cases liberal education is the stated purpose of their general education programs. Brown University's general education requirement—known as the Liberal Learning Courses Program—strives to familiarize students with “knowledge of the historical, philosophical, aesthetic, and scientific traditions that have shaped the civilizations of the world”; they

also assert that “the study of science and scientific ways of thinking is an essential component of a liberal education,” that the “study and production of the creative arts, literature, and other modes of expression is a crucial step in expanding the range of our human experience,” and that development of the ability to communicate effectively orally and in writing is essential (paras. 5, 9, and 14). Indiana University claims that “a liberal arts education . . . is by tradition the heart of undergraduate education in the American University system” (para. 3). The University of Wisconsin emphasizes education of the complete person, education for citizenship, education for a productive life, and education for the love of learning; they further define the goals of liberal education as “competency in communication [and] in using the modes of thought characteristic of the major areas of knowledge, knowledge of our basic cultural heritage, and a thorough understanding of at least one subject area” (para. 7). As these examples illustrate, many AAU members’ missions include a remarkable degree of specificity regarding liberal learning, taking into account that these institutions define themselves as fundamentally rooted in research.

With the exception of MIT and Ohio State, all of the institutions’ missions refer prominently to one or more of the components of liberal education defined in Chapter II. Foremost among these is preparation for citizenship, which appears specifically in ten universities’ missions and is implied in more than two dozen others. In addition to their purpose of generating new knowledge, America’s leading universities clearly consider it their mandate to prepare their graduates to contribute meaningfully to the civic life of a democracy. Other liberal education components receiving multiple mentions are diversity, leadership development, moral responsibility, creativity, personal discovery, critical thinking, problem solving, values, and breadth of knowledge.

B. MAJOR AND DEGREE REQUIREMENTS

AAU universities display a broad range of philosophies when it comes to the percentage of degree requirements devoted to the major. They range from 20 percent of total degree requirements (the University of Oregon, where 36 of 180 credits are devoted to the major) to 47.2 percent (the University of California at Los Angeles, where 85 of 180 units are required for the major). The mean is 31.4 percent. This is important because a high percentage indicates a bias toward a single discipline in students' programs of study, leaving less time for the breadth associated with liberal education. The median value was 30.7, reflecting the consistent distribution among all AAU universities; in other words, there are no extreme values, despite the wide range. The standard deviation from the mean is 6.3, probably because a fairly high number of schools are clustered in the 25 percent range; with that exception, the distribution follows a normal curve, as depicted in Figure 1.

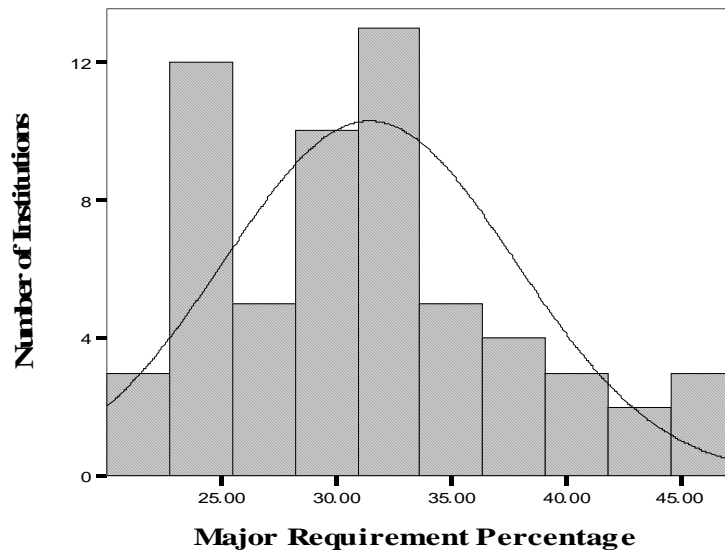


Figure 1: Major requirement percentage

At every institution in the sample the total degree requirements were based on a full-time course load for four academic years. Some institutions based their requirements on a specified number of courses, including Harvard (16 courses), Princeton (31 courses), Brandeis and Brown (32 courses), Cornell and Duke (34 courses), University of Pennsylvania and Yale (36 courses), and the University of Chicago (42 courses). The remaining institutions use a credit-hour approach or its equivalent, with the exception of three technical institutions (Caltech, Carnegie Mellon, and MIT). The mode value was 120 credit hours, which was the requirement at 26 institutions. When the 12 institutions noted are removed from the sample, 54 percent of the remaining institutions require exactly 120 credit hours, and 79 percent require between 120 and 132 credit hours. The eight-semester, 120-credit requirement is thus a *de facto* standard among research universities. This has implications for general education programs and liberal learning goals, because this approach permits students to fulfill degree requirements by selecting among a large and diverse array of courses that carry varying amounts of credit. Most of the AAU institutions are quite permissive in these requirements as long as the students assemble 120 credit hours and meet distribution requirements.

C. NATURAL SCIENCES REQUIREMENTS

More credits are required in the natural sciences and mathematics than in any of the other disciplinary areas in 90 percent of the AAU institutions (54 of 60). This is reflected in the greater mean value of the natural sciences requirement, which represents an average of 9.2 percent of all degree requirements (Table 1). The range was substantial because two institutions have no natural sciences requirement and one (Caltech) requires students

to complete nearly a third of their courses in the natural sciences, not including courses completed for the major.

Table 1: Disciplinary area degree requirements

Disciplinary Area	Mean Percentage	Median Percentage	Mode Percentage	Standard Deviation	Range
Natural Sciences	9.21%	9.17%	10.0%	4.52	28.40
Arts and Humanities	7.25%	7.5%	5.0%	3.24	14.52
Social Sciences	6.30%	6.59%	5.0%	2.91	14.45
Writing/Speech	3.59%	3.18%	2.5% 11.0% (multiple modes)	2.28	10.0
Specialized	4.40%	4.31%	0.0%	3.77	12.50
Total General Education	30.31%	31.18%	32.50%	9.28	46.01

As Figure 2 illustrates, the distribution of natural sciences requirements is clustered in the range of eight to twelve percent of the total undergraduate degree requirements. The number of institutions in this range is nearly double the value that would be predicted by a normal curve. In other words, there is a fair amount of agreement among research universities that this constitutes the appropriate level of exposure to the natural sciences and mathematics for a liberally educated person.

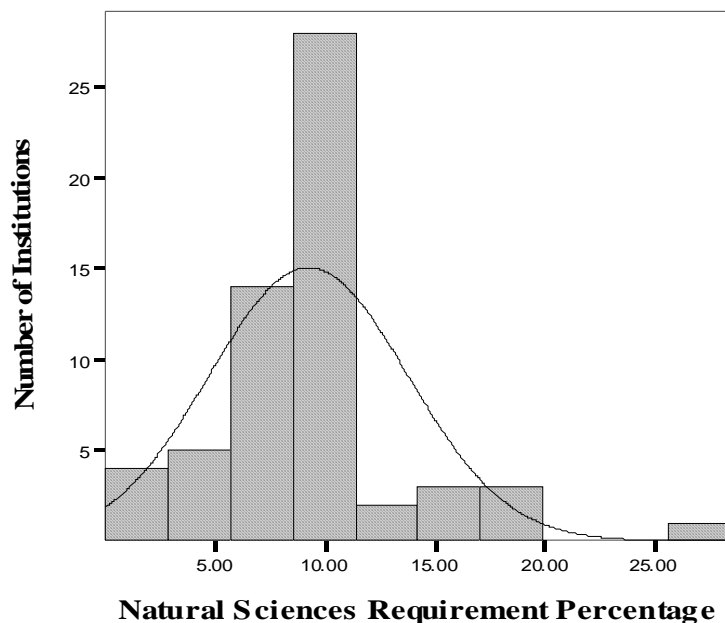


Figure 2: Natural sciences requirement as a percentage of total degree requirements

D. ARTS AND HUMANITIES REQUIREMENTS

Arts and humanities courses constitute an average of 7.25 percent of research universities' total degree requirements (Table 1). The arts, especially creative arts, are mentioned frequently in the institutions' mission statements; they are noted specifically in the missions of institutions as diverse as Penn State, SUNY Buffalo, and the Universities of Iowa, Maryland, and Michigan. Despite this prominence in the mission, only three institutions in the sample—Columbia, Penn State, and the University of California-Santa Barbara—require more courses in the arts and humanities than in the natural sciences.

Median values were calculated in order to address the possibility that the presence of four technical schools (Caltech, Carnegie Mellon, Case Western, and MIT) skewed the

sample in favor of the natural sciences. In fact, the median value of 7.5 percent, which was unaffected by extreme values among these institutions' requirements, also lags behind the median natural sciences requirement of 9.17 percent. The standard deviation of 3.24 represents a more compact distribution around the mean than was the case for the natural sciences, where the standard deviation was 4.52.

There is a fair amount of diversity in research universities' arts and humanities requirements. Figure 3 illustrates the percentage of arts and humanities degree requirements in comparison to a normal curve. Approximately one-third of the institutions require nine to ten percent of their courses in the arts and humanities, but more than half (37 of 60) require less than eight percent of their courses in these areas. When it comes to the arts and humanities, there was less agreement among institutions as to the appropriate proportion of degree requirements than for the natural sciences.

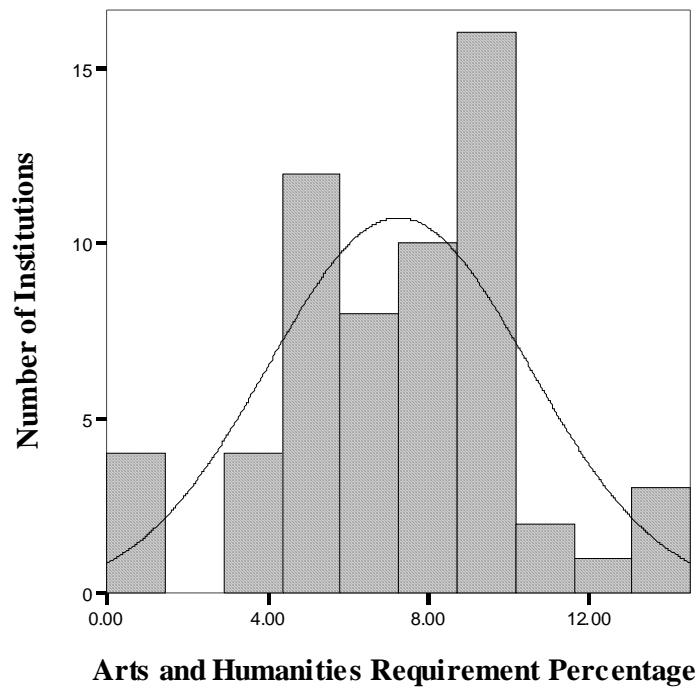


Figure 3: Arts and humanities requirement as a percentage of total degree requirements

E. SOCIAL SCIENCES REQUIREMENTS

The mean percentage of social sciences courses required by AAU members was 6.3 percent, with a median of 6.59 percent. The percentage range of 14.45 (from zero courses required by Brown and Johns Hopkins to 14.45 percent required by the University of Washington) was nearly identical to the range in the arts and humanities, but the distribution is more uniform, closely approximating a normal curve (Figure 4).

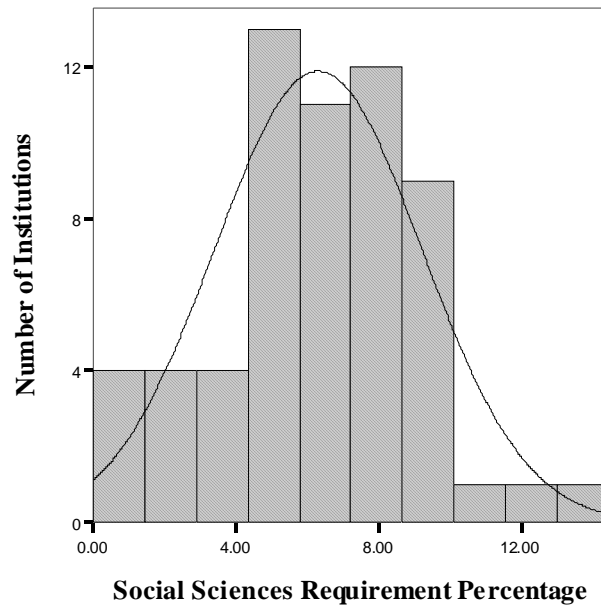


Figure 4: Social sciences requirement as a percentage of total degree requirements

The amount of consistency in the social sciences requirements was remarkable in comparison to requirements in other academic areas. Of the 38 institutions on the approximately 120-hour standard, nearly half required exactly nine or exactly 12 credits, representing three or four courses, respectively. The others were not far from that range. Part of the reason was that social sciences courses are less likely to include specialized

elements such as lab courses or creative activities. Perhaps more significant, however, was the fact that social sciences received short shrift in universities' mission statements, which much more frequently referred to scientific discovery (in the natural sciences, that is) and to the creative arts. Thus it was not surprising that the social science requirement percentage was lower than was the case for the other two major academic divisions, although not by a large amount. The precise nature of the compatibility among institutions in the social science requirement reflects a less creative approach to the social sciences' place in liberal learning; for example, many institutions simply stated their requirement as "three courses in the social sciences" or something similar. In the natural sciences and arts and humanities, the course requirements frequently demanded that students choose from various course groupings and organizational paradigms, such as biological and life sciences, physical sciences, laboratory experiences, creative expression, or critical interpretation. The overall results suggest that AAU members respect the need for rough equity among academic divisions when determining general education requirements, but the philosophical foundation for the social sciences in the liberal learning lexicon is not as well established as it is in the natural sciences and arts and humanities.

F. WRITING AND SPEECH REQUIREMENTS

Communication was emphasized repeatedly in research universities' mission statements, but courses that emphasize writing and speech represented a small percentage of total degree requirements (a mean of 3.59 percent, as reported in Table 1). The communications course requirements are overwhelmingly dedicated to writing rather

than speech; while a small number of institutions (Carnegie Mellon, the University of Nebraska, and the University of Wisconsin) emphasize general communication, only two—the Universities of Iowa and Kansas—specifically required a course in rhetoric or oral communication. The most common approach was to require an introductory writing course—although many options existed for placing out of such courses—and to rely on upper-division courses to provide more advanced writing instruction. Fifteen institutions specified a writing requirement beyond introductory composition, but this expectation did not require students to complete any credits; it was instead fulfilled by double counting courses in the major or electives with substantial writing elements.

General education programs of a generation ago would probably have required a higher percentage of writing and rhetoric courses, but the trend toward writing across the curriculum has relegated composition-specific courses to the least prominent position among modern general education requirements. The 60 institutions in the sample had a variety of approaches to teaching writing—not all articulated the writing across the curriculum approach of the 15 noted—but they were remarkably consistent in the proportion of the curriculum that they dedicated specifically to communication-based courses. Eight AAU members required no writing or speech courses, and of the remaining 52 institutions, 40 (77 percent) required between two and five percent of their classes in writing or speech, which generally translated to one or two courses (Figure 5). In other words, the relatively minor place of communication-specific courses held true whether or not an institution had adopted the philosophy of writing across the curriculum.

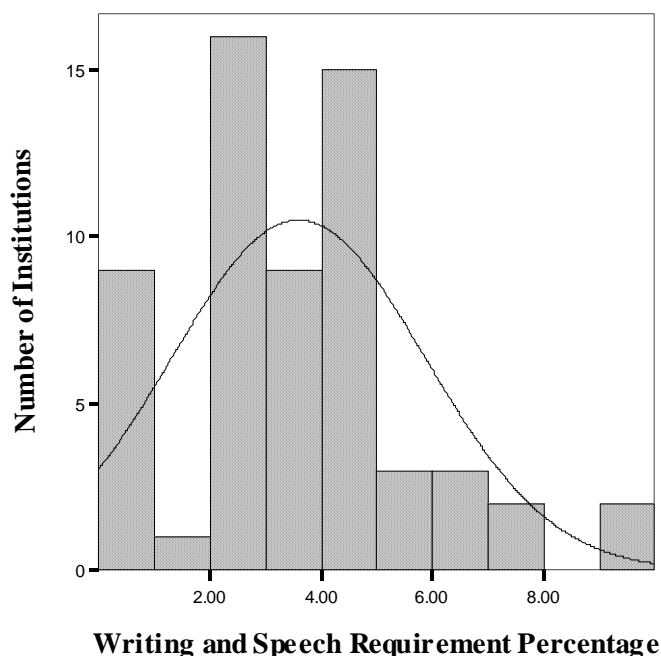


Figure 5: Writing and speech requirement as a percentage of total degree requirements

G. SPECIALIZED REQUIREMENTS

The specialized requirements varied dramatically from institution to institution in both content and requirement percentage, where they had the most uneven distribution of any category (Figure 6). The most common requirement by far was foreign language, which was needed for graduation at 31 of the 60 universities. Foreign language credits were not included in this study, however, since most of the 31 institutions permit students to fulfill their language requirement by presenting high school credits. The remainder typically allow students to fulfill the language requirement by demonstrating proficiency through placement examination or by completing the final course in a two-, three-, or four-course sequence. Unlike all other general education subjects in the sample, foreign language

requirements can be fulfilled without advanced post-secondary study, an option that generally does not exist for mathematics, natural sciences, and writing, for example.

Two other subjects appeared with great frequency in the specialized category: non-western cultures courses—required at 19 institutions—and diversity or multiculturalism courses, which were required by 16 schools. Physical education appears to be on the wane, as it was required at only seven AAU universities. The University of North Carolina at Chapel Hill required prospective graduates to pass a swimming test, but that was the only specific physical education requirement among the entire AAU membership. The combination of foreign language, non-western cultures, and diversity courses—representing the vast majority of specialized requirements—constituted an effort by research universities to define a liberally educated person as one with an appreciation for gender, ethnic, and racial diversity.

These culturally-related requirements are claiming a prominent place in the general education curricula, with a mean value of 4.4% of all degree requirements, surpassing the writing and speech requirements (Table 1). This value is higher than might be anticipated in light of the fact that the mode is zero percent, since 17 institutions required no specialized courses at all (with the exception of demonstrating language proficiency). This appears to be an element of general education that is in flux, as illustrated by Figure 6.

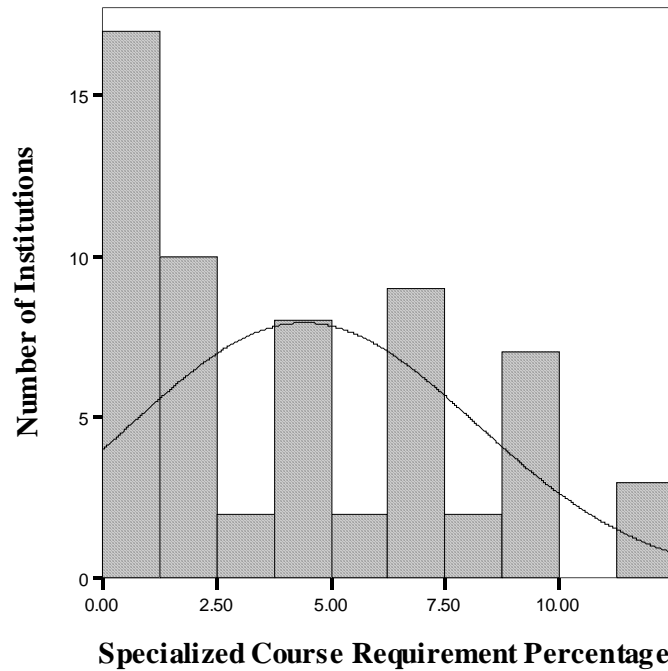


Figure 6: Specialized course requirements as a percentage of total degree requirements

There was little agreement among AAU members as to the appropriate portion of the curriculum that should be dedicated to specialized requirements. Since the specialized category is becoming closely identified with cultural and diversity studies, this finding represents a significant philosophical difference among various institutions as to their definition of a liberally educated person. This is a category that must be studied over time to see whether the peaks and valleys in Figure 6 will assume the more consistent distributions apparent in the other academic areas, where there is greater agreement across the AAU population.

H. GENERAL EDUCATION REQUIREMENTS

AAU members are fairly uniform in the percentage of degree requirements that they devote to their total general education programs, with 40 of the 60 institutions requiring between 27 percent and 40 percent of their courses in general education (Figure 7). The mean value is 30.3 percent, and with the exception of a small number of institutions with minimal requirements (only 2 schools require less than 10 percent of their courses in general education), the AAU members are clustered at a requirement of approximately one-third of their baccalaureate programs in general education.

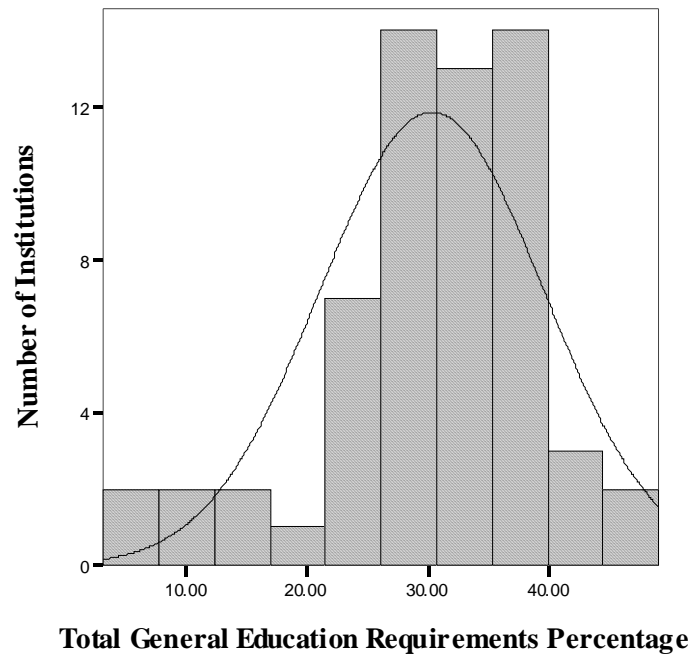


Figure 7: General education requirements as a percentage of total degree requirements

One of the most striking results was the similarity between major and general education requirements, with mean values of 31.4 percent and 30.3 percent, respectively. On the whole, AAU members required students to complete approximately as much work

in the general or liberal education areas as they did in the major, with the remainder of their coursework devoted to electives. Figure 8 depicts a school-by-school comparison of major requirements and general education requirements, and while it illustrates the dramatic disparity within individual institutions (e.g., institution number 2, which requires 34 percent of its courses in the major, and only 3.1% in general education), it also demonstrates the general tendency of major requirements and general education requirements to cluster around the 30 percent mark.

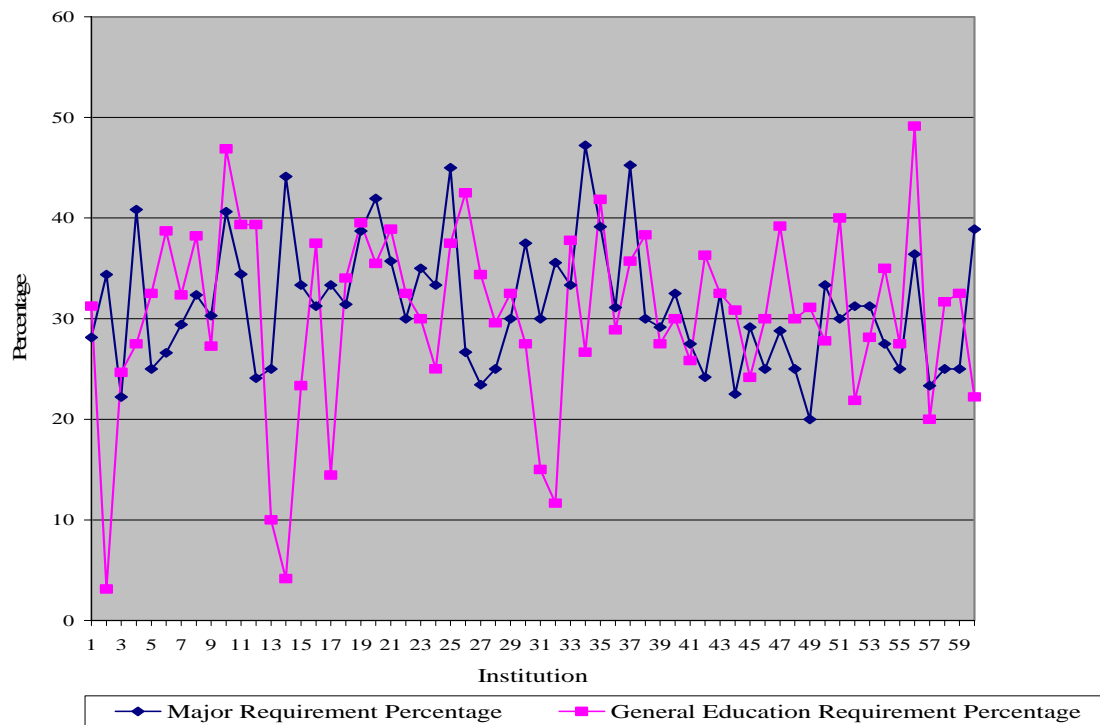


Figure 8: Major requirement and general education requirement percentages at AAU institutions

This figure also illustrates the general tendency toward greater agreement among AAU institutions as to the proportion of the degree program that should be dedicated to the

major than is the case for general education, where the swings between peaks and valleys are larger.

These research universities generally paid significant attention to liberal learning in their mission statements and reflected that commitment in their general education requirements. They also strove to achieve rough equity, or at least substantial representation, among the three major academic divisions of the natural sciences, arts and humanities, and social sciences, as well as cultural and diversity studies. On the whole, they devoted less attention to courses specifically aimed at improving students' communication skills.

V. DISCUSSION

A. LIBERAL EDUCATION AT RESEARCH UNIVERSITIES

This study suggests that liberal education is an important part of the educational program at research universities. They acknowledge the importance of liberal learning in their mission statements and attempt to achieve it in their general education programs. To the degree that educational breadth defines liberal education, research universities strive to construct degree requirements that place a similar importance on disciplinary diversity as on the major. But why is this important for research universities? Why do they not focus on their research mission—for which their staffing and funding infrastructure has been optimized—and leave liberal education to other types of institutions, including liberal arts colleges?

Preparation for citizenship lies at the heart of this question. The AAU members represent a group of universities widely recognized as the training ground for America's future leaders in government, business, science, and other professions (e.g., all but one of the Ivy League schools are AAU members). If the democratic ideal depends on the participation of a broadly educated citizenry—conversant in the social, political, technological, and economic issues critical to self-governance—then restricting this type of learning from the nation's elite institutions would eventually undermine educated political participation. It would be all too easy for research universities to concentrate on research to the exclusion of liberal education, since research is often a source of substantial outside funding and research results can lead to media exposure and other

marketing opportunities. Sustaining the type of undergraduate general education breadth indicated by this study's results implies a significant commitment to liberal education on the part of AAU members.

As the United States grow increasingly aware of the value of diverse viewpoints, especially in regard to governing an ethnically and culturally diverse populace, institutions of higher education must prepare students for multiple ways of learning and communicating. Over-emphasis on the disciplinary major and related research is inimical to this goal. Courses in cross-cultural communication and understanding have a prominent place in research universities' curricula; in fact, the "specialized" category, heavily weighted toward diversity-based courses, is nearly as prominently represented as the traditional academic division of social science (a mean of 4.40 percent of total degree requirements, versus a social science mean of 6.30 percent), and more prominently represented than writing and speech courses (a mean of 3.56 percent). This calculation excludes foreign language instruction for reasons already mentioned, but in the case of many universities included in the sample, the addition of foreign language requirements would bring the mean closer to that of the natural sciences and arts and humanities (9.21 percent and 7.25 percent, respectively). Based on their curricular requirements, many AAU members appear to recognize the importance of diversity education as an essential tenet of liberal learning, and to honor this commitment through their degree requirements.

The scope of human knowledge is too vast to define the particular skills and information that students must acquire to be liberally educated and to be prepared to participate in the civic life of a democracy. What level of quantitative reasoning is required to understand basic economic principles? How many diverse world views

should be studied in order to vote responsibly on social issues? What kinds of artistic and critical perspectives best illustrate ethical principles and historical lessons? The best that research universities can hope to do is to define a fundamental competence level for all undergraduates and to pursue it through diverse course offerings, which is, after all, no worse than liberal arts colleges' approach (Cejda and Duemer, 2001). The fact that there is no universal agreement on which specific knowledge and skills constitute the ideal core is not an indictment of the elective or distributional approach; rather, its virtue lies in the fact that AAU universities use their educational influence to expose students to *some* breadth, acting on faith that their graduates will be prepared for civic life. A baccalaureate degree is not required in order to understand basic political, economic, social, and technological systems, but the collective general educational program of America's colleges and universities—particularly the AAU universities—nevertheless constitutes some sort of national standard.

Liberal education at research universities is important because citizens should be capable of critical reasoning and should possess the capacity for synthesizing good decisions out of an abundance of information from disparate fields of knowledge. General education programs are necessary not only for their disciplinary content, but also for their facility in fostering critical thinking skills. This study does not reveal what kind of job AAU members are doing at this important task, but it does indicate that their approach is similar to liberal arts colleges, for whom critical thinking and lifelong learning are foundational principles. Disciplinary breadth exposes students to a variety of ways of acquiring and using knowledge, and will theoretically contribute to critical

thinking by teaching students how to make meaning and to solve problems from multiple intellectual perspectives.

B. RESEARCH UNIVERSITIES AND LIBERAL EDUCATION THEORY

At a minimum, this study's results speak to research universities' performance on the components of a liberal education outlined in Chapter II. Some liberal learning elements are prominently represented in AAU members' general education requirements while others are largely ignored, or at least not represented in any systematic way. This may have more to do with an inadequate common definition of liberal education than with a lack of commitment on the universities' part, since they devote such a substantial portion of their curricula to general education. Despite the mission statement rhetoric and the required disciplinary breadth, there remains no commonly accepted definition of liberal education, producing an uneven performance on liberal education components.

B.1. Critical and creative thinking

This is the most heavily represented liberal education component in the literature, but it is undefined in university mission statements (despite frequent references to it) and course requirements do not indicate a specific strategy for fostering critical thinking among AAU universities as a group. The most concrete references to critical thinking fall in arts and humanities requirements, where some schools require courses in critical theory and perspectives. These courses are individualized and disciplinary based; only one institution (the University of Colorado) requires a core course in critical thought. Critical thinking is at the heart of a broad liberal education, but the evidence indicates that AAU members rely on an accidental concatenation of critical modes derived from a variety of

courses in order to achieve it. This may or may not work—this study does not purport to answer that question—but if so, it is not the result of deliberate and structured connections within and between courses, or of engagement with specific course material.

Possibly a student who studies basic mathematics, with a linear approach to problem solving, can make an intellectual connection between that course and an introductory chemistry or psychology course that focuses on the scientific method. It is less likely that such a connection will be made with a creative or performing arts course, or with a cultural studies course that examines different ways of making meaning of the world. Yet all of these courses—and more—provide the foundation for developing critical thinking skills. Three institutions have specialized requirements in epistemology or cognition, leaving 57 schools that rely on students to find coherence among their general education distribution requirements. For a liberal learning principle as widely accepted as critical thinking, AAU members are surprisingly silent as to how their general education programs are expected to achieve it.

B.2. Written and oral communication

The literature speaks forcefully to the importance of written and oral communication (see Chapter II, p. 10). The trend toward writing across the curriculum makes it difficult to assess research universities' performance on this standard because many of them rely on written work in upper-division disciplinary-based courses for much of their writing instruction. Oral communication is rarely mentioned.

Writing instruction in upper-division courses presumably enhances students' ability to write in the academic style characteristic of their majors. These courses are taught by professors whose academic training is not based in written or oral

communication, but for whom writing is an important professional credential; many of them are published authors and accomplished speakers. Nevertheless, they have been hired and evaluated by academic departments who are experts in a selected discipline, so there is generally not a consistent system for evaluating their instruction specifically in written and oral communication. This stands in contrast to instructors in composition and rhetoric courses, whose performance is evaluated primarily on their ability to teach students to write and speak.

Required general education communication courses thus provide some measure—and a consistent one across institutions—of the degree to which universities value education that is specifically dedicated to writing and speaking. By this measure, there is a significant gap between what the literature advocates and what universities actually do. Communication requirements—which focus almost exclusively on writing—constitute an average of only 3.59 percent of a student’s course load. Nine AAU members do not require any course in writing or speaking, relying on other courses to teach students communication skills as they are learning the course content. The mean represents approximately one and one-half courses, but this is skewed by a small number of institutions with substantial requirements. The median of 3.18 percent represents slightly more than a single course, and 35 of the 60 AAU members require only zero or one course in writing or rhetoric. As is the case with critical thinking, written and oral communication is a component of liberal education that is frequently mentioned in the theory and in mission statements, but research universities’ curricula do not reflect this commitment in their degree requirements.

B.3. Quantitative reasoning

Quantitative reasoning, on the other hand, is prominently featured in AAU members' degree requirements. Natural sciences courses represent the single largest requirement outside of the major, and many universities require students to complete courses specifically aimed at developing quantitative reasoning skills, in addition to discipline-based natural sciences courses in which they practice those skills. This study does not consider the question of whether there is an intrinsic issue of cognitive process at work here (e.g., does it take longer to learn material in some natural sciences disciplines than in the arts and humanities?), but based strictly on percentage of degree requirements, research universities have a substantial commitment to developing quantitative reasoning skills.

Curiously, the presence of technical institutions in the sample does not skew the results (the mean percentage is 9.21 and the median is 9.17). The heavy concentration of natural sciences requirements runs throughout most of the AAU universities. There is no evidence to suggest that the universities' research orientation increases the emphasis on the natural sciences; in fact, other aspects of liberal education are featured more prominently than quantitative reasoning in their mission statements, including creativity, appreciation for diversity, and preparation for citizenship. In any case, there is little doubt that this component of liberal education is adequately fulfilled by research universities' general education programs.

B.4. Understanding diversity

The specialized requirements examined in this study are heavily weighted toward helping students understand and value diversity. Research university diversity courses emphasize

internationalism, American multiculturalism, and foreign languages. Their general education requirements on the whole do not insist that students engage with diverse ways of knowing, or that they explore economic, religious, and political diversity, with the exception of the degree to which these factors influence students' study of world cultures. There may not be universal agreement on the definition of diversity or the types of diversity that should constitute the research university curriculum, but there is a clear trend toward increasing the presence of diversity in the curriculum, and to giving it a place that parallels the status of communication and social sciences courses.

The distribution system that dominates general education in AAU universities is both the advantage and the bane of diversity education. In addition to basic requirements, the distribution system allows students to explore a wide variety of courses and to include in their degree programs a myriad of authors, an expansive selection of other course material, and a multiplicity of world views. Only two institutions have what might be called a core curriculum, but even those institutions offer students the opportunity to select diverse courses as part of their elective programs. Research universities in general have abandoned the quest to define a specific body of knowledge that constitutes liberal education, choosing instead to offer a smorgasbord of learning opportunities from which students can select. This approach offers students a great deal of variety, but it can also lead to lack of coherence within students' individual academic programs, and can permit them to avoid so-called "diversity" courses, with the exception of basic requirements.

AAU members' mission statements also feature diversity prominently (although generally without defining it); in fact, it is mentioned more frequently than any other component of liberal education, with the exception of preparation for citizenship. They

honor this commitment with a fairly substantial diversity requirement—one that is every bit the equal of requirements in traditional academic divisions, if foreign language requirements are included in the calculation. Diversity is, however, the most amorphous of the degree requirement categories, with the greatest variety within it. It remains to be seen whether time will produce a more generally agreed-upon approach to diversity education, as it has for traditional academic disciplines. In any case, research universities agree that understanding diversity is fundamental to liberal education and they devote substantial resources to it in terms of course offerings and requirements.

B.5. Intellectual, ethical, and aesthetic growth

Intellectual growth is a prominent theme in university mission statements and it is a unifying theme throughout the broad requirements across academic divisions. It is fundamental to the purpose of higher education and it is universally recognized as central to universities' reasons for being. Aesthetic growth also receives a moderate amount of attention in the mission statements, and is featured in the rationales for arts and humanities requirements. Ethical development, on the other hand, is largely ignored or left to chance, depending on students' choices among distribution requirements.

For many AAU members, aesthetic growth and arts and humanities requirements go hand in hand, similar to the correspondence between understanding diversity and specialized course requirements. Indiana University's mission, for example, refers to "appreciation of literature and the arts" (para. 2). The University of Missouri strives to "advance the arts and humanities" (para. 1). The University of Nebraska calls "the aesthetic and intellectual experience of literature and the arts" a "fundamental area of knowledge" (para. 4). As these examples illustrate, aesthetic appreciation, for those

research universities who strive to achieve it, rests largely in the arts and humanities distribution requirements. And the arts and humanities category is prominently featured among all course requirements, constituting 7.25 percent of all degree requirements, second only to the natural sciences among general education requirements.

Ethical development is occasionally mentioned in AAU members' mission statements, but there is little in their general education requirements that is specifically designed to foster it. Only two institutions require a course in this area: Harvard, with a course in moral reasoning, and Princeton, with a course in ethics and values. Ethical development may be a component of particular content-based courses at other universities, but for 58 institutions in the sample it does not have a course dedicated to it, nor do other required classes specify ethics or moral reasoning as part of their course descriptions. Ethical decision making is an implied value in other liberal education goals, such as preparation for citizenship and critical thinking, but it is difficult to gauge whether AAU members are in fact developing students' moral and ethical senses through required courses. If research universities believe that ethical development is part of liberal learning—as their mission statements suggest that they do—then their curricula are failing to pursue this goal, especially in comparison to quantitative reasoning or aesthetic development.

B.6. Problem solving

Problem solving is a difficult concept to track strictly through course requirements, since it is embedded in many other courses and pedagogical approaches. No university in the sample required a course specifically in this area, but many of their other requirements in all academic divisions offered the opportunity for learning to solve problems from a

variety of perspectives and intellectual approaches. In other words, AAU members may be doing an admirable job of teaching students to solve problems or they may not be; the results of this study do not answer this question definitively.

Despite this dearth of direct evidence, there is some indication that research universities do not address this as precisely as they could. For example, many medical schools have turned to a problem-based course content and pedagogical strategy to prepare their graduates for professional practice. It is possible to design curricula to achieve this end and it is practical across many fields of study. Social science courses can theoretically teach students to understand and address real-world problems. Natural science and mathematics courses can engage students with the scientific methods and technological tools for the purpose of solving both abstract and concrete problems. Diversity courses are well suited to developing students' problem-solving skills, because they ideally teach students to consider multiple perspectives while learning about the complex problems that led to the emergence of diversity requirements in the first place. A problem-based undergraduate curriculum is in the grasp of research universities, but it is not currently in evidence in the requirements of any AAU members.

B.7. Preparation for citizenship and social responsibility

Preparation for citizenship is the single most prominent component of liberal education mentioned in research university mission statements. AAU members appear to be keenly aware of their important role in educating America's citizenry, and they typically associate preparation for citizenship with liberal learning and with their general education programs in particular. NYU, for example, seeks to equip students "for lives as thinking individuals and members of society" (para. 4). Purdue strives to "prepare its graduates to

succeed as leaders [and] . . . responsible citizens” (para. 5). The University of Florida’s mission calls for nurturing “generations of people from diverse backgrounds to address the needs of our societies” (para. 4).

How these universities plan to address this aim is less clear. The mission statements, taken in combination with their general education requirements, imply that the total educational experience will produce students who are responsible citizens. With a few exceptions, there is little in the way of course requirements that indicates whether students learn about democracy, civic engagement, or the importance of political participation. They are broadly educated in the natural and social sciences, arts and humanities, and cultural diversity, but curricular requirements generally do not include a capstone experience where students learn to connect their new-found knowledge with societal needs. Only one institution—Texas A & M—requires a course in citizenship. A small number of others require courses in American history or political science. In light of its rhetorical prominence, preparation for citizenship is underrepresented in general education requirements at research universities.

B.8. Self knowledge and identity

AAU members largely ignore this component of liberal education. No university requires a course in this area, and only a small number require a first-year seminar, where students might explore issues of identity as part of developing their plans of study and determining their career goals. Self knowledge is also absent entirely from research universities’ mission statements, with the exception of implications tied to preparing students to lead useful lives or instilling a lifelong love of learning.

Scholars argue that self knowledge should be part of a liberal education in order to enhance their understanding of the world and their place in it (see Chapter II). Courses specifically aimed at this characteristic are not readily found in traditional academic disciplines—in contrast to courses that develop writing skills or quantitative reasoning—so it is not surprising that a review of general education requirements does not speak to self knowledge or identity. On the other hand, some liberal learning characteristics that also do not fit neatly into existing course requirements, such as problem solving or preparation for citizenship, are still featured as goals of most research universities’ general education programs. Simply stating these goals may help students to derive meaning from diverse courses that develop problem-solving skills or prepare them for citizenship, even if that is not the explicit purpose of any one course. The absence of self knowledge from not only course requirements, but also university goals indicated that AAU members did not consider this to be an important component of a liberal education and that they are not achieving it with the greatest efficacy, if at all.

B.9. Working collaboratively with others

As is the case with problem solving and citizenship, this component of liberal education may be fostered across courses and academic disciplines. It is unique among these characteristics, however, in the fact that working collaboratively with others may be achieved best through pedagogical approach, rather than course content. Are general education courses of a size and structure that encourage small group work? Do they take place in classrooms equipped for interactive conversation and problem solving? Are instructors trained and rewarded for fostering collaborative work through course assignments and classroom meetings? This teaching style has historically not been a

strength of research universities, but with the emergence of honors colleges and a renewed emphasis on undergraduate teaching, perhaps universities are improving in this regard. A study of university missions and general education course requirements revealed no hint of this, however, despite the fact that other intangible components of liberal learning are apparent, including ethical growth, preparation for citizenship, and problem-solving ability, none of which are achieved by dedicating specific courses to them.

B.10. Foreign language skills

AAU members deliver a mixed message when it comes to foreign language requirements. On the whole, they place a clear and powerful emphasis on the importance of foreign language; it is required at more than half of the institutions and encouraged at others. At the same time, they imply that foreign language skills do not need to be taught at the advanced level required of other subjects, since the bulk of the foreign language requirement can be met through secondary school courses. Many institutions require that students demonstrate proficiency at a level of at least a second year of college study (the most common expectation is that students complete a third course or the equivalent), but they exempt students from the first courses in the sequence, or even the entire sequence, by presenting high school transcripts. In many cases, testing is not required to demonstrate proficiency.

This stands in contrast to mathematics, natural sciences, writing, and literature, where many high school students have had advanced study. For example, it is not uncommon for an advanced high school graduate to have completed calculus, which exceeds the general education mathematics requirement of all of the AAU universities.

The universities build on the secondary school record by requiring courses of escalating difficulty and specialization, since their missions call for them to expand students' knowledge, skills, and intellectual capacities, rather than to certify an established base level of competence. Yet in the case of foreign language, the certification approach is common, even standard, among research universities.

Does this reflect some quality in the field of language studies itself that enables it to be fulfilled differently than other academic disciplines? When a student reaches a defined level of competence—achieved at the high school or university level—has she or he met the expectation for a liberally educated person? If so, then it is curious that this philosophy is not apparent to such a degree for any other subject. Nevertheless, the prevalence of foreign language requirements among research universities' general education requirements indicates a fundamental belief that studying a foreign language is characteristic of a broad liberal education.

C. LIBERAL EDUCATION IN PRACTICE

The membership of AAU represents the gold standard in comprehensive research and teaching at American universities. They produce much of the nation's cutting-edge research in all fields, admit many of the most highly qualified students from the United States and abroad, and offer coveted positions for faculty members to pursue research agendas. They also have an unparalleled place in history and in the nation's consciousness that identifies them closely with the best in higher education; the superlatives that describe their membership includes the nation's oldest, largest, wealthiest, and most highly ranked universities by most popular measures.

This status means that liberal education need not be prominent in the mission of these universities, as would be the case for a small liberal arts college. But their commitment to liberal learning is revealed not only by their mission statements and public statements of purpose, but also by their common practices in terms of course requirements and approaches to undergraduate education. On the whole, this commitment is present in terms of public pronouncements, course distribution breadth, specialized course development, and balance with research practices.

Public pronouncements such as mission statements have a mysterious place in these universities. A manufacturing or customer service firm may have a short, precise mission that keeps employees focused on a common purpose. Research universities, on the other hand, exist in an environment that encourages them to be all things to all people. They employ a professional class of faculty members and administrators who expect to exercise a fair amount of independence (individually and collectively) in pursuing research, designing courses, and determining approaches to teaching. They encompass a level of complexity found in few other organizations, due to the staggering number of simultaneous pursuits in research, teaching, and service, as well as the vast numbers of people who populate their campuses. They manage an infrastructure that is every bit the equal of small cities. AAU universities, public and private, answer to constituencies that include, at a minimum, government officials, alumni, students, faculty, staff, community members, and the foundations and agencies that fund their research. This complexity makes it difficult for universities to distinguish themselves from one another in their mission statements, or to craft specific and targeted public statements about their sense of

purpose. Many students, faculty, staff, and alumni may perceive that the mission statement has little or no impact on their daily lives.

Yet most AAU members have chosen to include liberal education, or significant components of liberal learning, in their statements of purpose, despite the fact that liberal education is poorly understood and undervalued by the public (Hersh, 1997). Why does this matter if mission statements are largely ignored? The answer lies in the fact that in comprehensive institutions of this sort, the mission influences the structure and work of the university in the broadest sense. For example, a mission that emphasizes producing new knowledge, providing a liberal education, and serving the community—the three most common principles found among AAU members’ missions—supports a huge variety of activities designed to fulfill one or more of these purposes. Remove liberal education from this list, and it is possible that over time the shape of undergraduate education may change. As decisions are made about resources, course content, and pedagogy, the areas most central to the mission are likely to grow while others decline. On the largest scale, if America’s leading research universities are not committed to liberal education we could see a potentially deleterious shift in citizens’ ability to govern themselves from a broadly educated perspective. Such is the influence of AAU members in the higher education spectrum.

Of course, there are many ways to deliver a liberal education. This study reveals that a distribution system emphasizing breadth across academic divisions currently dominates the research university landscape. No AAU members rely strictly on a common core to provide a liberal education. Even the University of Chicago, pioneers in the great books curriculum, now permits students to select from an array of courses. The

current system for most research universities is a hybrid of Eliot's free elective system, developed at Harvard in the nineteenth century (Westermeyer, 1997), and a core curriculum defined by academic divisions, rather than by particular courses or specific course content. The distribution system has drawbacks, including the potential lack of coherence within an individual student's course of study and the risk of failing to expose any given student to material that may be deemed critical by one theorist or another, but what it lacks in these areas it makes up for in breadth.

This educational breadth common to AAU members is at the heart of this study. If these universities can claim nothing else about their effectiveness at liberally educating students, they can legitimately claim that all students are exposed to a variety of fields of knowledge, ways of making meaning, and intellectual perspectives. This approach is so firmly entrenched in American higher education that it is difficult to imagine what shape a different paradigm might take. What if, for instance, a university decided that the most important element of liberal learning was preparation for citizenship, or the ability to communicate effectively? In the existing system, whether by default or intention, research universities have determined that breadth trumps all other considerations when it comes to producing liberally educated graduates.

One of the most intriguing features of research universities' liberal education practices is the emergence of specialized requirements, especially those related to ethnic, racial, and cultural diversity. Many AAU members have declared this to be essential to liberal education (supporting, as it does, other liberal learning goals such as problem solving, preparation for citizenship, and engaging multiple perspectives), despite the fact that these specialized requirements do not fall neatly into established fields of knowledge

and inquiry. Borrowing from sociology, anthropology, education, economics, political science, art and literature, and many other fields, these specialized courses exist because of universities' decisions to make diversity education part of the mission, rather than as linear extensions of inquiry in traditional fields. This implies that liberal education is alive and well at research universities, even if specialized requirements were not designed explicitly under the rubric of liberal learning. The fundamental philosophy of what it means to be liberally educated, especially in regard to preparing students for leadership in a democratic society, is at the heart of the diversity requirements that have claimed such a significant place in research universities' undergraduate curricula.

All of these efforts to achieve educational breadth and liberal learning at the undergraduate level must be balanced with the research agenda that is so prominent at all of the universities in the sample. The tensions between research and undergraduate teaching are predominately related to resource allocation, rather than to intellectual incompatibility. Popular critiques of higher education frequently refer to talented faculty members who have little contact with undergraduates due to their research agendas, or to inadequate undergraduate instruction on the part of unprepared graduate students (Boyer, 1987). Finite resources can force universities to make difficult decisions about teaching load, class size, admissions standards, or other considerations that affect undergraduate teaching. Ideally, research and teaching have an interdependent relationship where students contribute to faculty members' creative process and engage in experiential learning by assisting with research, and where the generation of new knowledge feeds into undergraduate education in terms of both course content and intellectual excitement. This uneasy balance represents an ongoing challenge for AAU members.

Further study will be required in order to determine exactly how successful research universities are at providing undergraduate liberal education, but to the degree that course requirements illustrate their commitment to liberal learning, they are fulfilling this purpose fully. The most direct evidence for this lies in the proportionality between broad course requirements and the major. For the AAU population as a whole, major requirements track closely with general education requirements (see Chapter IV). Research universities are as committed to exposing students to educational breadth as they are to engaging them with a defined subject area in an established academic department, which is typically the wellspring of university research activity. For many of these universities, their lofty reputations ensure strong student enrollment and its associated tuition revenue whether or not they honor their mission-based commitments to liberal learning, so the rough balance they have achieved between research and liberal education is probably driven by more than economic considerations. Educational philosophy and service to society appear to play a legitimate role in defining research universities as comprehensive educational institutions, rather than as strictly research-oriented think tanks.

D. THE PROBLEM OF GENERAL EDUCATION

The review of the literature establishes the strong correspondence between research universities' general education programs and their liberal learning mission. Liberal learning goals are addressed across the curriculum, but the most reliable measure of an institution's liberal education rests in the general education program as the only set of courses required of all students. If general education does not proscribe a collection of

courses that foster breadth of knowledge, communication skills, aesthetic development, and preparation for citizenship, then there is no guarantee that a student who selects a particular major will in fact be a liberally educated graduate.

The challenge associated with relying on general education as the primary means to deliver liberal learning lies with the uncertain status of general education programs themselves. General education at large universities has been criticized on all fronts for being undervalued, treated as a second-class citizen within the curriculum, inadequately conceived and carried out, improperly assessed, and even incompetently delivered (see Chapter II). The strong correspondence with liberal education means that problems in the general education curriculum will result in shortcomings in liberal learning.

The strengths of the distribution approach, especially in terms of educational breadth and diversity of options, can be undermined if universities do not create a system for helping students to make meaning of their courses and to understand the relationships between them. The results of this study indicate that research universities are largely failing in this regard and that they have an opportunity to design capstone courses—which are required only at a small number of AAU universities and even then only in the major—or other methods, such as sophisticated advising systems, to help students forge coherence among their plans of study. This challenge may be endemic to a system that offers students multiple educational options, because research universities have not failed to establish coherence through lack of effort. Many AAU members have lengthy advising forms that encourage students to make course selections with intellectual connections and thematic correspondence. In most cases, however, they do not require students to do so, because such a requirement would undermine the breadth that is such a

prevalent component of their educational philosophies. If students are not required to learn a defined core of knowledge and skills, then institutions of higher education must accept the risk that some students will make choices that are not coherent with one another, or that omit course material that some faculty members would consider to be essential.

One problem facing many AAU institutions is the potentially weakening effect of the double-counting provision for general education course requirements. This might be called a dirty little secret when it comes to commitment to broad general education. Universities fulfill a rhetorical commitment to general and liberal education by requiring exposure to a broad array of courses, but in many cases, students can fulfill that requirement by double counting a course that also meets major requirements or other distribution requirements, thus engaging the student with less breadth than might appear at first glance to be the case. Seventeen of the 60 AAU universities permit students to fulfill requirements by double counting at least some courses. It is certainly possible that students will be exposed to just as much breadth through this system—for example, an upper-level major course in economics may legitimately teach students about diversity—but it is also possible that the double-counted course may not expose students to the same depth that a dedicated general education course would have. Universities lose some measure of control over general education learning outcomes when double counting blurs the distinction between general requirements and the major.

General education programs have also been found wanting when viewed in the light of our nation's increasing interest in higher education assessment. Assessment is fairly straightforward on a course-by-course basis, where traditional assignments such as

exams and papers demonstrate, at least to a significant degree, what students have learned. Evaluation of majors is somewhat less clear, but due to the fact that major programs deliver a cumulative body of knowledge to a defined group of students, there is still some potential for assessing the program through capstone courses or projects, or indirectly through graduates' performance in graduate school or the workplace. This type of evaluation is much more complicated when it comes to the entirety of a general education program, especially when that program is designed around the distribution system. How does a university assess whether its graduates are truly liberally educated? If some effort is made to evaluate particular components of liberal learning through senior surveys or similar means, how does the institution know how much of that learning is the result of the general education program, as opposed to other courses or life experiences that took place during the undergraduate career? The complexity of these assessment questions is why general education, at least to a certain degree, must be based on belief in a defined educational philosophy and executed with a fair amount of faith. Historically the liberal arts and sciences have provided the basis for that educational philosophy in the United States, and the results of this study suggest that this continues to be the case for research universities, even as their liberal learning emphasis shifts from delivering a defined body of knowledge to fostering educational breadth.

E. RESEARCH UNIVERSITIES VERSUS LIBERAL ARTS COLLEGES

AAU members have powerful research missions that influence virtually every aspect of the university, yet for all of that their curricula look remarkably like liberal arts colleges' (and vice versa). Cejda and Duemer (2001) found that liberal arts colleges rely primarily

on their general education programs for meeting liberal education goals, just as at research universities, and that their curricula are not limited to the classical liberal arts and sciences disciplines. In fact, pre-professional majors are very much in evidence at these colleges, so they are clearly looking beyond the major to fulfill their claims of providing a liberal education. These colleges do not all have the resources to be mini-versions of research universities so the range of programs is typically smaller, but the essential structure is not. For the most part, liberal arts college curricula are built around a major, general education requirements, and electives, and their missions usually involve some forms of research, teaching, and service. They differ from AAU universities in terms of scale, quantity of programs, and emphasis, especially in regard to the balance between teaching and research.

This study reveals that the curriculum does not, in and of itself, represent a distinction between research universities and liberal arts colleges. Significant differences may exist in how courses are taught and in the character of a typical student's academic experience, but those differences are not explained by course requirements, the general education program, or even by academic breadth, long considered a hallmark of institutions that specialize in the liberal arts and sciences. On the contrary, research universities on the whole give general education a place similar to the major (in terms of proportion of degree requirements), strive to achieve balance among academic divisions, and require courses in emerging disciplines such as diversity studies. AAU members' general education programs are comparable to liberal arts colleges' in terms of their theoretical approach to broad liberal learning, and their potential to expose students to other components of liberal education such as writing, speaking, aesthetic growth,

problem solving, and preparation for citizenship. They also emphasize liberal learning in their mission statements, even if it is not at the foreground.

What then distinguishes these types of institutions from one another? Is such a distinction important? It certainly is for students trying to select the institution that is the best fit for them in terms of intellectual interests, career goals, and potential participation in the life of the institution. If liberal arts colleges try to attract students by promising to provide them with a broad education in the liberal arts and sciences, and to fulfill the other elements in the definition of liberal learning, then they are offering nothing to help prospective students distinguish them from research universities. By such a measure a student would be as well off choosing a college on the basis of lowest cost or geographic proximity. But we know that the type of institution, and the student's fit in that institution, does in fact matter a great deal to academic success (Astin, 1993; Pascarella and Terenzini, 1991). If this study enables us to eliminate the general education curriculum as a distinction, we must then turn to other potential differences for further study, and liberal arts colleges must make a greater effort to determine their unique characteristics and communicate them to students.

There are numerous possibilities for distinguishing between research universities and liberal arts colleges beyond general curricular requirements or availability of a specific major. Foremost among these is the way that the curriculum is delivered. Is a faculty member's primary responsibility teaching, research, or both? Are there reward systems for pedagogical innovation? How is teaching evaluated? Perhaps most importantly, what is the campus culture when it comes to teaching and learning for students and for faculty? Both categories of institutions may require a roughly even

distribution among the natural sciences, arts and humanities, and social sciences, but dramatic differences may exist in students' expectations for laboratory work, opportunities for creative endeavors, or potential to perform hands-on research. Liberal arts colleges must go beyond describing the breadth of their courses to a specific description of students' experiences in those courses if prospective students are to have the opportunity to choose the best fit for them.

In fact, the most important distinction between research universities and liberal arts colleges may be the most obvious: their sheer size. Honors colleges and residential living/learning units represent an attempt on universities' part to create a small college atmosphere on a large campus, but for a liberal arts college this feature is already an intrinsic part of their identity, made manifest in every aspect of their infrastructure, from class size to faculty availability, from residency requirement to sense of community. Research universities certainly benefit from the financial and human resources associated with their expansive missions, facilities, and staff, and it behooves liberal arts colleges to identify the different benefits associated with their smaller size. Offering a broad liberal arts curriculum is too easy of an answer, and in light of the modern university's curricular structure, not an especially helpful one.

F. LIBERAL LEARNING AND THE RESIDENTIAL EXPERIENCE

The research university's general education program is an important vehicle for developing liberal learning among students, but the literature also includes numerous references to the potential for the residential experience to contribute to liberal education goals (Astin, 1993; Kuh, 1995; Vincow, 1997). This serves as a potential distinction to

assist students in choosing among colleges and universities, and also as a point of reference for the student life program at research universities, whose programs ideally complement the general education program and contribute to liberal learning. One of the major implications of this study is the need for research universities to understand how out-of-class activities support liberal education, since the results indicate that curricular breadth alone cannot explain the learning outcomes differences between research universities and small colleges.

For the purposes of this discussion, residential education refers not only to living on campus, but to the engagement in the intellectual community that is more likely to occur in a small residential setting. This may include activities such as:

- Living in residence halls and participating in their social and educational activities
- Participating actively in student organizations, including cultural, governance, service, social, religious, and special interest groups
- Participating in college-sponsored non-academic activities, including athletics and the performing arts
- Working closely with a faculty member or other mentor on an individualized basis, including performing independent research sponsored by a professor
- Being involved in the life of the academic community in informal ways, including attending lectures and events and forming personal relationships with faculty and staff
- Influencing institutional policies and practices through committee service or less formal means.

These activities take place at large research universities as well as small residential colleges. But the scale of the institution is likely to influence the potential for student engagement in out-of-class activities, including those that contribute to liberal learning. For example, Ohio State has a large residential population for a university of its type. The University sponsors 336 organizations of all sorts for undergraduate and graduate students, including many for groups with a specifically—in some cases narrowly—defined interest (e.g., surgery interest group, Queer Christians, Pagan Student Association, Cricket Club). These groups serve approximately 50,000 students. By contrast, nearby College of Wooster, with 1,800 students, sponsors 108 organizations. Ohio State averages 148 students per organization, while Wooster averages 16. Despite the large number of options at Ohio State, any given Wooster student is more likely to be involved in an organization by a factor of 9.

Continuing with this comparison, all of Wooster's 1800 students are required to live in residence halls. Despite Ohio State's large residential system (31 residence halls), they can house only a fraction of their students. Wooster's faculty-student ratio is 13:1 (all faculty devoted primarily to undergraduate teaching), while Ohio State must rely more heavily on part-time faculty and teaching assistants. There is no doubt that an Ohio State student has the opportunity to live on campus, develop close personal relationships with faculty members, get involved in student activities, and become engaged in the academic community. But based simply on ratios alone, a given Wooster student is much more likely to do so.

The residential college experience, while often centered and begun in the residence hall, includes many factors that increase the likelihood of engagement in the

college community. When this engagement is present, student development goals, including those that correspond to the goals of liberal education, are more likely to be fulfilled. Strange (1996) underscores the importance of campus “subenvironments” (e.g., cluster colleges, residence hall units, student organizations, and class sections), that “more fully engage students in meaningful ways and in which students can experience a sense of functional importance and identity” (p. 263). He goes on to point out that “effective educational environments present human-scale communities that offer opportunities for congruence, encourage involvement, and fulfill educational purposes consistent with the institution’s organizational culture” (p. 265).

Critical thinking, communication, appreciation of diversity, preparation for citizenship, and development of self awareness are among the liberal education components that can be significantly enhanced by the residential experience. These characteristics have the potential to correspond closely to research universities’ general education requirements, and to assist students in making meaning of the course material they encounter.

F.1. Critical thinking

One of the most potent tools for enhancing students’ critical thinking skills is a close mentoring relationship with a faculty member, especially through independent inquiry and research. It is axiomatic that large classroom settings and computer-scored examinations do not foster mentoring relationships, emphasizing instead accumulation of knowledge. On the small residential campus, however, students are encouraged—sometimes required through senior comprehensive projects or other means—to develop this kind of relationship with a faculty member. AAU members, with their world-class

faculty and research facilities, have the potential to enhance critical thinking skills by encouraging and rewarding faculty mentors, and by building on the skills developed in general education courses.

Mentoring is a challenging concept because it occurs organically; it is difficult to create through formal programming or curricular structures. It is related to pedagogical approach in that students who are brought into close contact with faculty, through small group discussions or individual research projects, are more likely to feel that a professor is approachable. Mentoring ultimately depends on human relationships; no matter how carefully structured a mentoring program might be, if students do not feel a personal connection with a faculty member a true mentoring relationship cannot develop.

Small residential campuses offer an ideal forum for nurturing these relationships. On a small campus students are more likely to have contact with faculty members in informal settings, including lectures, artistic performances, and athletic contests. They are also more likely to have chance encounters in dining halls or the student union. On-campus residence is central to this concept. Students who travel to campus only for class meetings or formally structured events must schedule individual time with professors, and serendipitous meetings will rarely, if ever, take place. AAU members must contend with the fact that the size of their institutions presents a barrier to this kind of relationship building, since it necessarily depends on human-scaled subcommunities (Strange, 1996).

When close mentoring relationships form, students get a first-hand look at the life of intellectual inquiry. They learn to differentiate scholarship from straightforward academic achievement. They observe the delicate balance among the roles of teacher, scholar, practitioner, and citizen. In many cases, conversations range far beyond assigned

course material to political, economic, social, and personal issues. These conversations provide an object lesson in critical thinking, since broad topics are addressed from multiple perspectives, and decisions are examined in the light of multi-disciplinary perspectives. This ideal is not achieved for every student, of course, but when a true mentoring relationship is developed students can see critical thinking in action, rather than applying it strictly through established and limited course assignments.

One of the hallmarks of critical thinking is the ability to formulate questions. Students need to have their assumptions challenged. For many, college is the first opportunity for intensive self-examination about personal values, life expectations, and career interests. They have accumulated facts but may not have had the life experiences to make meaning of them. The mentoring relationships facilitated by a residential college not only give professors the opportunity to ask students questions, but to help them form their own habits of inquiry, in both the scholarly and personal senses. Asking hard questions and assembling a framework for answering them—a foundation of liberal learning—is a life skill that students can apply to all of their future endeavors.

F.2. Communication

Once again, there is little to distinguish research universities from liberal arts colleges in terms of communication course requirements. In order to understand how the residential experience can enhance communication skills, institutions of all types must also understand how communication can be integrated throughout the curriculum and campus life opportunities.

Communication skills are fundamentally experiential. Students become better writers only through repeated writing and revising. The same is true for oral

communication. Large classes do not encourage lengthy writing assignments, since the burden on a single instructor would be too great. The same is true for speaking in class, whether through formal presentations or spontaneous class discussion. The smaller the enrollment, the more numerous the opportunities (or expectations) for in-class verbal exercises. Small residential colleges offer the opportunity for this kind of speaking and writing in nearly every course, so these skills are developed across the curriculum. Large research universities are less likely to offer this opportunity in all courses; in fact, it is in the general education program where students are least likely to encounter small classes. Students who write frequently and speak often in a variety of courses—rather than strictly in composition and speech classes—have greater potential to develop strong communication skills, through repetition if nothing else.

Co-curricular activities offer a similar opportunity. Leadership positions often demand sophisticated verbal skills, and the ratios demonstrated in the Ohio State/Wooster example imply that students attending small residential colleges are more likely, on a percentage basis, to hold leadership positions in student organizations. Speaking in front of groups is commonplace on small residential campuses, where a smaller pool of students populates student organizations, residence hall councils, student government offices, debate teams, and athletic or artistic groups. The same is true for media production and the performing arts; for example, theater productions at large universities are likely to be dominated by students majoring in that field and active in the department, but on small residential campuses, students from all fields are active in plays and television productions.

F.3. Diversity

Large universities are much more likely than small colleges to enroll many students from a substantial variety of ethnic groups. Students on small campuses may have less exposure to diversity, but that exposure is likely to be more intensive due to the residential nature of the campus. The most talented students tend to place the highest value on diversity, especially ethnic diversity (Light, 2001), and to understand diversity more profoundly when they develop close personal relationships with people from different backgrounds.

Casual acquaintances formed through classroom or workplace contact are less likely to nurture deep personal friendships than the intensive experiences of living together or participating in some long-term mutually interdependent activity, such as playing on an athletic team. For example, Penn State University offers 29 varsity athletic programs for its nearly 40,000 students. St. Lawrence University, a residential liberal arts institution in upstate New York, also sponsors 29 sports, but over 50% of the student body are intercollegiate athletes. St. Lawrence students may be exposed to fewer students with differing ethnic backgrounds and life experiences, but any given student is more likely to be in intensive personal contact with them.

The same is true of residence halls, perhaps the ultimate crucible for human interaction at the college or university level. Students living in residence halls have little choice but to learn to live successfully with others. The press of many people in small spaces, usually sharing sleeping rooms, lounges, and bathrooms, facilitates letting down of guards and encourages intimate sharing. It is difficult not to get to know someone well when sharing a nine- by twelve-foot room. Developing close friendships is a way of life

and a survival mechanism for students in this situation. When that interpersonal contact enhances appreciation for diversity, so much the better. And in light of the prominent representation of diversity courses among research universities' specialized course requirements, there is potential for enhancing students' understanding by connecting their residential experience to course content—but only if those students are in fact part of the residential life of the institution.

F.4. Preparation for citizenship

Many AAU members include preparation for participating in the civic life of a democracy in their missions, but few of them promote the myriad ways in which the residential experience fosters citizenship. This may reflect their relative weakness, in comparison to liberal arts colleges, as residential communities.

Living on campus requires extensive self governance in both formal and unstructured ways. Most residence halls sponsor hall councils to assist with educational and social programs, based on the assumption that students are more likely to benefit from these activities if they have a hand in creating them. Students also develop informal residential communities with their own values, language, and traditions. They learn how to work successfully with others and develop skills at communication, negotiation, and compromise. Participation in residential self governance activities often results in rewards for students, such as a more comfortable living environment and more attractive and successful programs. Poor citizenship can be self-regulating, as students who ignore community standards (at least those that constitute the unwritten group mores, if not official institutional rules) may be ostracized or disempowered. Students learn the value

of participatory citizenship in small, local communities, where an individual's vote truly does make a difference.

F.5. Self awareness

Development of self knowledge and identity is already a weakness in research universities' general education curricula, as previously described. But if universities are to fulfill this component of their liberal education missions, they must help students to develop a sense of their place in the world and recognize how their careers, lifestyles, and relationships intersect to create a balanced, healthy, and productive life. Once again, the residential experience has promise for contributing to the development of self awareness and for producing more fully liberally educated graduates.

Co-curricular experiences such as career internships, community service, and international study are ideally suited to this endeavor. In order for a student to determine life goals and discover personal values, he or she must experience life outside of familiar, established routines. Internships in potential career fields offer students a glimpse of how the world functions outside of their homes and campuses, including the ways in which teams work together on common goals, the application of knowledge to real-world problems, and the concept of professionalism. Community service activities alert students to social issues with broad implications, including housing, health care, hunger, and community development. International programs offer students the opportunity to view themselves and their society from new perspectives, and to develop independence, self-reliance, and cultural sensitivity (in addition to practical knowledge of languages, history, politics, and economics). Small residential campuses offer opportunities for a much larger proportion of their students to participate in these sorts of experiential

learning activities, but large research universities can offer a greater variety of choices. Communicating these offerings clearly can help prospective students choose the option that is best for them.

G. IMPLICATIONS AND SUGGESTIONS FOR FURTHER STUDY

This research points out the necessity for research universities and liberal arts colleges to describe themselves in terms other than those limited strictly to the formal curriculum. Current and prospective students, as well as faculty and staff, will be well served if institutions more clearly understand their offerings and the reasons for them. This is true of the residential experience as well, because it provides the primary distinction between these two types of institutions and because of its potential contributions to liberal education.

This study indicates that all academic divisions are represented in research universities' general education programs, but not equally represented. Diversity requirements should be studied over time to see whether they grow to occupy a place comparable to the traditional academic divisions. Communication requirements should be evaluated to determine whether students are in fact becoming better writers as the result of the shift of writing requirements into double-counted disciplinary content courses, and to determine whether students are learning speaking skills at all, in light of the absence of rhetoric requirements.

Based on the finding that liberal education is centrally important to the mission of research universities, and the fact that many smaller institutions define themselves in terms of the liberal arts and sciences, there is a pressing need for a more thorough and

widely-known definition of liberal learning. Liberal education is at the foreground of American educational philosophy and curricular structure, so it is problematic that it is not more precisely defined and appreciated. Many students may not realize that the distribution courses they are required to take form the basis for teaching the knowledge and skills characteristic of liberal education. They may also be unaware that their institutions are attempting to prepare them for participating in the civic life of a democracy. Even in the context of the loose distribution system prevalent at research universities, a simple clarification of general education's purpose may help students to make meaning by forging greater intellectual coherence among the various courses they take.

VI. CONCLUSION

America's leading research universities balance their research missions with a commitment to liberal education that is present in their mission statements, general education requirements, and course distribution proportions. Most AAU members attempt to fulfill this commitment by requiring students to take courses within the traditional academic divisions of natural sciences, arts and humanities, and social sciences, as well as communication and specialized courses. Courses related to ethnic and cultural diversity are the most heavily represented subjects in the specialized category. The universities in the sample require the greatest number of credits in the natural sciences, followed by the arts and humanities, social sciences, specialized courses, and finally writing and speaking courses.

Most research universities use a distribution system that offers students a wide variety of choices within specified categories of courses. This system provides multiple perspectives but has the potential for a lack of coherence in students' overall academic programs. The cumulative general education courses roughly correspond to the major in terms of the proportion of total credits required to earn a bachelor's degree.

AAU members on the whole base their general education programs on the liberal education philosophy; they make multiple references to the knowledge and skills that characterize liberal learning. Approximately one-third include a specific reference to liberal education in their missions. Despite the prominent place of liberal learning as the foundation of research universities' general education programs, there is little agreement

on the specific definition of liberal education. The most prominent characteristics in mission statements are critical thinking skills, preparation for citizenship, appreciation of diversity, communication skills, and artistic or creative expression. The characteristics mentioned with the lowest frequency are self-knowledge or identity, working collaboratively with others, and foreign language skills. This study of general education requirements indicates that in practice—contrary to the values espoused in their mission statements—the most important liberal arts principles for AAU members are breadth of knowledge and quantitative reasoning ability.

There is little difference in content and structure between the general education programs at research universities and those at liberal arts colleges. Prospective students or others who select a liberal arts college based on their interest in educational breadth would in fact find a similar program at research universities. The results of this study suggest that both types of institutions should seek ways to describe their programs that go beyond strictly curricular definitions.

APPENDIX

AAU MEMBERS LOCATED IN THE UNITED STATES

Brandeis University
Brown University
California Institute of Technology
Carnegie Mellon University
Case Western Reserve University
Columbia University
Cornell University
Duke University
Emory University
Harvard University
Indiana University
Iowa State University
The Johns Hopkins University
Massachusetts Institute of Technology
Michigan State University
New York University
Northwestern University
The Ohio State University
The Pennsylvania State University
Princeton University
Purdue University
Rice University
Rutgers, The State University of New Jersey
Stanford University
Stonybrook University-State University of New York
Syracuse University
Texas A&M University
Tulane University
The University of Arizona
University at Buffalo, The State University of New York
University of California, Berkeley
University of California, Davis
University of California, Irvine
University of California, Los Angeles
University of California, San Diego
University of California, Santa Barbara

The University of Chicago
University of Colorado at Boulder
University of Florida
University of Illinois at Urbana-Champaign
University of Iowa
The University of Kansas
University of Maryland at College Park
University of Michigan
University of Minnesota, Twin Cities
University of Missouri-Columbia
University of Nebraska-Lincoln
The University of North Carolina at Chapel Hill
University of Oregon
University of Pennsylvania
University of Pittsburgh
University of Rochester
University of Southern California
The University of Texas at Austin
University of Virginia
University of Washington
The University of Wisconsin-Madison
Vanderbilt University
Washington University in St. Louis
Yale University

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