

The impact of working on undergraduate students' interactions with faculty

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This research was supported by a generous grant from the Center of Inquiry in the Liberal Arts at Wabash College to the Center for Research on Undergraduate Education at The University of Iowa.

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Three decades of research on college students indicates that faculty members play a central role in the development of undergraduate students (Astin, 1993; Pascarella & Terenzini, 1991, 2005; Kuh & Hu, 2001; Umbach & Wawyrzinski, 2005). Studies suggest that out-of-classroom interactions with faculty are positively associated with gains in academic and cognitive development (Terenzini, Pascarella, & Blimling, 1996), personal and intellectual growth (Astin, 1993; Endo & Harpel, 1982; Pascarella & Terenzini, 2005), and student satisfaction (Kuh & Hu, 2001; Endo & Harpel, 1982). These interactions are frequently the best predictors of student persistence (Braxton, Sullivan, & Johnson, 1997; Pascarella & Terenzini, 1991; Stage & Hossler, 2000). Likewise, instructional approaches, such as cooperative learning, teacher organization and clarity, and high expectations for students, positively influence cognitive growth (Pascarella & Terenzini, 1991, 2005; Pascarella Edison, Nora, Hagedorn, & Braxton, 1996).

Although we know a good deal about how faculty affect the student experience and student learning, we know relatively little about the extent to which working college students engage with faculty in ways that contribute to their growth while in college. While many students must work to cover college costs and to acquire career-related experiences, it is reasonable to assume that, because time is finite, working during college likely reduces the amount of time available for interacting with faculty and fully engaging in the collegiate experience (Pascarella & Terenzini, 2005; Stinebrickner & Stinebrickner, 2004). Relatively few studies have examined whether working inhibits student relationships, both in and out of the classroom, and the amount of effort they put into their studies. In turn, little, if any research

has examined whether experiences with faculty differentially effect the cognitive growth of working students.

Purpose and research questions

Given the relative dearth of information on the interactions of faculty with working students, this chapter seeks to fully explore the working students' experiences with faculty. The purposes of this study are fourfold. First, this chapter explores the effect that working while in college has on students in- and out-of-class experiences with faculty members. Second, we examine whether working affects growth in cognitive outcomes after the first year of college. Third, this study tests whether certain faculty approaches to instruction are particularly useful in reducing any differences in cognitive growth that we see after the first year of college. Finally, based on our findings, we provide practical ways that policymakers, college administrators, and faculty can enhance the college experience and student learning for undergraduates who work.

Three specific research questions guide our research:

1. To what extent do students who work engage in best practices in education, particularly those related to college faculty, at the same level as their nonworking student peers?
2. To what degree does working affect cognitive outcomes after the first year of college?
3. Are there particular best practices that ameliorate differences in cognitive outcomes between working and nonworking students?

This chapter begins by providing readers with a description of the best practices in undergraduate education that are said to contribute to student learning and an exploration of studies that apply these best practices to students who work while in college. We then describe the methodology and analytical approach we employ to answer our research questions. We follow our discussion of methods with a full explanation of the results of our analysis. Finally we

conclude the chapter with a discussion of our findings and of policies and practices that policymakers, administrators, and faculty can employ to ensure a positive educational experience for working college students.

Background

The Seven Principles for Good Practice in Undergraduate Education highlight the importance of recognizing the complicated interaction between content and pedagogy (Chickering & Gamson's 1987, 1991) and serve as a guide for this study of students who work. These practices include encouraging cooperation among students, encouraging active learning, communicating high expectations, encouraging contact between students and faculty, giving prompt feedback, respecting diverse talents and ways of learning, and emphasizing time on task. As Chickering and Gamson (1987) suggest, faculty and their relationships with students are central to these practices. Yet, when time is constrained, it is quite logical that students who work do not have the time to full engage in the learning experience as their nonworking counterparts.

Within this larger context of best practices in undergraduate education is the underlying value placed on pedagogical strategies and the incorporation of socialization as a mechanism towards active learning. Encouragement of student-faculty contact both within and outside the classroom is considered the most important principle in supporting student motivation and involvement within the collegiate environment (Chickering & Gamson, 1987). This principle focuses less on the role of the faculty member as a content instructor and more on the importance of interpersonal relationships between faculty and student. Interpersonal interactions with faculty are often viewed as an intricate and impactful part of the college experience (Pascarella & Terenzini, 1991). Moreover, the impact of faculty interactions is enhanced when the contact

moves beyond the classroom and into out-of-class experiences (Kuh, 1995; Pascarella & Terenzini, 2005). These interpersonal interactions can range from encouraging and supporting intellectual endeavors and future career goals to personal discussions unrelated to academics. However, evidence suggests that informal interactions that focus on intellectual and substantive material appear to have a greater impact on student learning (Pascarella & Terenzini, 2005).

A substantial amount of research supporting the Seven Principles has focused on college teaching and the importance of student-faculty contact (Sorcinelli, 1991). Since Chickering and Gamson's work nearly two decades ago, a myriad of researchers have evaluated the impact of student-faculty contact on a number of college outcomes. The empirical evidence suggests that frequent student-faculty contact positively influences student learning and development (e.g. Astin, 1993; Kuh & Hu, 2001; Pascarella & Terenzini, 1991, 2005) and gains in cognitive development (Cruce, Wolniak, Seifert, & Pascarella, 2006; Pascarella & Terenzini, 2005; Terenzini, Pascarella, & Blimling, 1996) and personal and intellectual growth (Astin, 1993). Examining the effects of student-faculty interaction during the 1990's, Kuh and Hu (2001) conclude that these interactions positively influence a student's effort to engage in other educationally purposeful activities during their undergraduate studies.

Surprisingly, few studies have examined the effects of student employment on involvement levels of interactions with faculty in- and out-of-the-classroom. By definition, the amount of time allocated towards working hinders student involvement in other college learning experiences (Astin, 1993; Furr & Elling, 2000; Horn & Berktold, 1998; King & Bannon, 2002; Pascarella & Terenzini, 2005). It seems that working students must sacrifice key socialization opportunities since some time is absorbed by work. However, research does suggest that working on campus may supplement as a valuable mechanism of socialization. In particular, maintaining

a part-time, on-campus job increases the likelihood of working or interacting with faculty (Astin, 1993; 1999). Employment opportunities that keep the student within the college environment allow the student to participate in out-of-class interactions and collaborations with faculty.

Two studies in particular examine the effects of student employment on the amount of time allocated towards faculty interactions, both of which find mixed results. Using data from the College Student Experience Questionnaire, Lundberg (2004) investigated the effect of working off campus on various levels of involvement in college experiences. Lundberg found students who work off campus more than 20 hours per week report significantly lower means on their levels of interactions with faculty compared to all other students. However, while Lundberg (2004) found that working 20 hours or more per week off campus has a negative effect on frequency of faculty interactions, working does not have a negative effect on learning. In other words, students working off campus compensate for their low levels of faculty interactions in ways that do not hinder their learning (Lundberg, 2004).

The second study was not limited to working off campus. Based on a single-institution sample, Furr and Elling (2000) surveyed undergraduate students on the relationship of work to their involvement in college. Furr and Elling found that working while in college is negatively related to frequency of interactions with faculty. Nonworking students were also more likely to establish a meaningful relationship with a faculty member. Examining the dichotomy of working on campus versus working off, Furr and Elling found that students who are employed off campus are less likely to interact with faculty. Conversely, student employment on campus had a positive effect on the levels of interactions with faculty.

The effect of working while in college on cognitive outcomes is also somewhat limited and inconclusive. Similar to the findings on working students and their levels of engagement,

evidence on the impact of college employment on cognitive outcomes is inconsistent (Gellin, 2003; Padgett & Grady, in press, & Pascarella & Terenzini, 2005). Some research suggests that working on campus during the first year of college is positively related with gains in reading and mathematics skills, but is unrelated to gains in critical thinking skills (Terenzini, Yaeger, Pascarella, & Nora, 1996). Others found no substantive difference in gains in reading comprehension, mathematics, and critical thinking between students who work on or off campus (Pascarella, Bohr, Nora, Desler, & Zusman, 1994; Pascarella, Bohr, Nora, & Terenzini, 1996; Pascarella, Edison, Nora, Hagedorn, & Terenzini, 1998). It also seems the amount of hours working on or off campus during the first year of college does not affect reading comprehension, mathematics, and critical thinking (Pascarella et al., 1994). In contrast, other research (Inman & Pascarella, 1998) suggests that working negatively affects the development of critical thinking skills.

From this research, we draw several conclusions that guide our analysis. First, relatively few studies have examined the extent to which working students engage with best practices as they relate to college faculty. Those that have explored these constructs have mixed results and often rely on limited samples or inadequate data. Second, few studies have examined the effects of working on cognitive development, and those that have find mixed effects. Third, it is important to examine both working on and off campus as well as the amount of hours worked. Clearly, where and how much students work has an effect on their college experience. Finally, previous research provides little guidance to faculty about specific techniques or approaches that are particularly effective in providing a learning environment that encourages the cognitive growth of college students who work.

Method

Sample and data collection

We utilize student-level data from 19 institutions that participated in the Wabash National Study of Liberal Arts Education (WNSLAE), a longitudinal study investigating the effects of the liberal arts experiences on various cognitive and psychosocial outcomes associated with a college education. The colleges and universities participating in the study represent a variety of characteristics including institutional type and control, size, location, and patterns of student residence. However, because the study was primarily concerned with the impacts of liberal arts colleges and liberal arts experiences, liberal arts colleges were purposefully over-represented. According to the 2007 Carnegie Classification of Institutions, 3 of the participating institutions were considered research universities, 3 were regional universities that did not grant the doctorate, 2 were two-year community colleges, and 11 were liberal arts colleges.

The initial sample was selected in either of two ways. First, for larger institutions, it was selected randomly from the incoming first-year class at each institution. The only exception to this was at the largest participating institution in the study, where the sample was selected randomly from the incoming class in the College of Arts and Sciences. Second, for a number of the smallest institutions in the study—all liberal arts colleges—the sample was the entire incoming first-year class.

The data collection was conducted in two waves. The initial data collection took place in early Fall 2006 with 4,501 students participating. Student demographic information, family background characteristics, high school experiences, and various precollege measures on cognitive and psychosocial outcomes were collected at time one. The follow-up data collection ($n = 3,081$) was conducted in Spring 2007. Two complementary survey instruments were administered to measure a myriad of student college experiences, student engagement, and

exposure to good practices: the National Survey of Student Engagement and the WNSLAE Student Experiences Survey.

In addition, a range of posttest measures on the cognitive outcomes were collected. While all students completed most of the instruments chosen to measure college outcomes, there were two exceptions due to concerns regarding the length of time required to complete the instruments, one of which, the CAAP Critical Thinking Test, we use for this study. Approximately half of the sample was selected to take the CAAP Critical Thinking Test while the other half took another assessment. Of the 3,081 students participating in both data collections, 1,485 had useable responses on the CAAP Critical Thinking Test.

After eliminating students with missing data, 2,772 students (89% of original completers) remained in our analyses for the following outcomes. A smaller subset, 1,366 students (92% of original completers), was used for a portion of the analyses, because the CAAP was administered to approximately half of the larger group. We weighted the follow-up participant data up to each of institution's first-year undergraduate population by sex (male or female), race (Caucasian, African American/Black, Hispanic/Latino, Asian/Pacific Islander, or other) and ACT score (or COMPASS/SAT equivalent). This weighting cannot adjust for non-response bias, but it does make the sample more similar to the population from which it was drawn.

Analytical approach

We conduct our analysis in three stages, each corresponding to one of our research questions. First, we run a series of ordinary least squares (OLS) regression to examine differences between working and nonworking students on nine best practices that faculty directly influence. We first run these models with only the work variables to assess the effects of working without controlling for differences between students. We then run our fully controlled models by

adding measures of student background characteristics (pre-college ability, gender, race, parental education, educational aspirations, pre-college high school involvement) and the college student experience (institutional type, living on campus, student athlete status, and Greek status).

Second, we run a series of OLS regressions exploring the effect of working on cognitive outcomes. Our three dependent measures are a series of cognitive scores collected at the end of the first-year of college. We use the same approach of entering variables into the regression in blocks. The first block includes only the work variables; the second block adds the control variables described above, as well as a pre-test measure for each of the cognitive outcomes.

Finally, we run a series of models that extend the regressions of our cognitive outcomes models described in the second stage by adding interaction terms. For these models, we calculate cross-products of the nine best practices variables and our work variables to assess the possible differential effect that the best practices have on different levels and types of work.

Dependent measures

We use a variety of outcomes for our dependent variables, all of which were collected at both the beginning and end of the first year of college. For the first set of analyses, we used nine good practices (See Appendix A for a detailed description of all of the variables used in our models) related to the faculty role in undergraduate education that are linked to personal and intellectual growth. The first six are measures of good teaching and interactions with faculty: *Faculty interest in teaching and student development* (e.g., the extent to which faculty are interested in helping students grow in more than just academic areas, the extent to which faculty are generally interested in teaching, and the extent to which faculty are willing to spend time outside of class to discuss issues of interest and importance to students); *Prompt feedback* (e.g., how often faculty informed students of level of performance in a timely manner, how often

faculty checked to see if students had learned the material well before going on to new materials); *Quality and impact of nonclassroom interactions with faculty* (e.g., extent to which nonclassroom interactions with faculty have had an impact on: intellectual growth and interest in items; personal growth, values, and attitudes; and career goals and aspirations); *Frequency of interactions with faculty* (e.g., how often one discussed grades or assignments with an instructor, how often one worked with faculty members on activities other than coursework such as committees, orientation, student life activities); *Overall exposure to clear and organized instruction* (e.g., frequency that faculty give clear explanation, frequency that faculty make good use of examples and illustration to explain difficult points, frequency that class time was used effectively, frequency that course goals and requirements were clearly explained); and *Cooperative learning* (e.g., in classes, students taught each other in addition to faculty teaching; participation in one or more study groups outside of class; how often one worked with other students on projects outside of class).

The final three good practice scales include three measures of the extent to which faculty challenge students and have high expectations. These measures include: *Academic challenge and effort* (e.g., how often one worked harder than one thought he or she could to meet an instructor's standards or expectations, number of hours a week spent preparing for class, extent to which one's institution emphasizes spending significant amounts of time studying and on academic work, number of assigned textbooks, books, or book-length packs of course readings one read during current year); *Frequency of higher-order exams and assignments* (e.g., how often exams or assignments require students to: write essays, compare or contrast topics or ideas from a course, argue for or against a particular point of view and defend an argument); and *Challenging classes and high faculty expectations* (e.g., how often faculty: ask challenging questions in class; challenge students' ideas in

class; ask students to argue for or against a particular point of view; ask students to point out any fallacies in basic ideas, principles, or points of view presented in the course).

In the second and third set of analyses, we use three different cognitive measures as our dependent variables. The first is the 18-item *need for cognition* scale. Need for cognition refers to an individual's "tendency to engage in and enjoy effortful cognitive activity" (Cacioppo, Petty, Feinstein, Blair, & Jarvis, 1996, p. 197). Those who have a high need for cognition "tend to seek, acquire, think about, reflect back on information to make sense of stimuli, relationships, and events in their world" (p. 198). In contrast, those with low need for cognition are more likely to rely on others, such as celebrities and experts, cognitive heuristics, or social comparison processes to provide or make sense of their world. The second cognitive outcome, *positive attitude toward literacy* (PATL) is a six-item construct designed to tap continuing motivation for lifelong learning. The PATL assesses students' enjoyment of such literacy activities as reading poetry and literature, reading scientific and historical material, and expressing ideas in writing. To assess *critical thinking*, we used the critical thinking module from the Collegiate Assessment of Academic Proficiency (CAAP) developed by the American College Testing Program (ACT).

Independent measures

In order to account for differences among students' backgrounds and college experiences, we introduced several controls into our models. They include background variables such as sex, race, ACT composite score, highest intended academic degree. We also include a measure of high school involvement. In addition, pretest measures of educational outcomes serve as controls in our models. We also add a series of college experience variables including place of residence, working on and off campus, Greek affiliation, and member of a sponsored athletic team. Finally, we also control for institutional type (e.g. community colleges, regional universities, and

research universities) with Liberal Arts Colleges serving as our reference group. As a result, we can more confidently attribute outcome scores to the college experience because we will have accounted for the students' starting scores (Astin & Lee, 2003; Pascarella, 2006).

We represent student work and its various dimensions using a series of dummy-coded variables representing the amount of time students work on and off campus¹. For students who work on campus, we code them as either working between one and 10 hours per week or more than ten hours per week. Off-campus students are coded into three groups: working between one and 10 hours per week, working between 11 and 20 hours per week, and working more than twenty hours per week. The comparison group for all of the dummy-coded groups is students who do not work.

Limitations

When examining our results, it is important to consider the limitations of our data. We offer two broad limitations. First, although the overall sample included a broad range of different kinds of postsecondary institutions from 11 different states, the inclusion of only 19 institutions and the fact that institutions were not selected randomly means that one cannot necessarily generalize the results to the population of all two-year and four-year institutions in the United States. Indeed, because a major purpose of the WNSLAE was to estimate the impacts of liberal arts colleges and liberal arts education, liberal arts colleges were purposefully over-sampled in the study. Likewise, our sample includes only full-time, first-year students. As a result, it is important to consider working students represent only 55% of our sample, which is substantially lower than their representation in the national college student population.

¹ We tested models looking including variables for students who work both on and off campus. None of these variables were statistically significant nor did they substantively change the effects of the other work variables. Therefore, we chose to drop them from our models.

A second limitation is the fact that not all students who participated in the first (precollege) data collection participated in the second (follow-up) data collection. The 68.5% persistence rate in the WNSLAE from the first to second data collections is quite consistent with other large longitudinal studies requiring a substantial amount of participation in terms of time and intellectual effort (see for example, the National Study of Student Learning, Pascarella, Edison, Nora, Hagedorn, & Terenzini, 1998). However, attrition from the first to second data collections is a limitation of the study. While our weighting procedures adjusted the final sample for respondent bias by sex, race/ethnicity, tested precollege academics, and institution, it is still possible that our study suffers from nonresponse bias.

Results

Effect of working on good teaching and interactions with faculty

Table 1 presents the summary OLS regression model results of the effects of working on student interactions with faculty in and out of the classroom. Because the dependent measures in all of our models are standardized (mean = 0, standard deviation = 1), we can describe these coefficients as a proportion of a standard deviation difference between the target group and the reference group (nonworking students). We observe mixed results regarding the effect of working on student perceptions of good teaching and their interactions with faculty. When only work is included in the models (see Model I), in general, working on campus less than 10 hours per week has a positive effect and working off campus more than 20 hours per week has a negative effect.

After controls for student background, college experiences, and institutional type, many of the differences between students who work and those who do not disappear (see Model II). However, when differences persist, working on campus tends to have a positive effect, and

working a large number of hours off campus tends to have a negative effect on perceptions of teaching and interactions with faculty. Compared with students who do not work, students who work more than 20 hours per week off campus rate their quality non-classroom interactions with faculty lower and participate less frequently in cooperative learning. Students who work on campus, regardless of the amount, interact more frequently with faculty than do non-working students. Interestingly, students who work off campus less than 20 hours a week also report more frequent interactions with faculty than their nonworking peers. Perhaps these off-campus student workers are forced to effectively manage their time, and, as a result, seek to take advantage of any opportunity to interact with faculty.

Effect of working on challenge, effort, and faculty expectations

The models of academic challenge and student effort reveal similar patterns (see table 2). In general, the uncontrolled models (see Model I) suggest that students who work a few hours on campus are more challenged and put more effort into their academics than do nonworking students. In contrast, students who work a lot of hours off campus generally are at a deficit when it comes to the amount of effort they put into their courses and what is expected of them. When we control for possible confounding variables (see Model II), many of these differences are erased, yet one troubling effect persists. Students who work off campus more than 10 hours per week report statistically significantly lower levels of challenge and effort than nonworking students. Students who work 11 to 20 hours a week off campus score 0.16 standard deviations (SD) lower than nonworking students; students who work more than 20 hours per week of campus score one quarter of an SD lower than nonworking students.

Effect of working on cognitive outcomes

Table 3 presents the summary results of the effects of working on cognitive outcomes of the first year of college. Similar to the results of the previous models, when we only include work variables in our models (Model I), we see substantial differences between working and nonworking students. Students who work on campus less than 10 hours per week score higher than nonworking students on all three of the cognitive measures. For two of the three measures, students who work any amount off campus score lower than nonworking students.

In the fully controlled models (Model II), all of the differences between groups disappear, with a few notable exceptions. Working more than 10 hours per week on campus positively affects students' attitude toward literacy. More compelling are the effects of working off campus on critical thinking. Even after controlling for the critical thinking pre-test and a host of other variables, students who work off campus more than 10 hours per week score approximately 0.15 to 0.16 SD lower on critical thinking than nonworking students after one year of college. We explore this relationship further in the following section.

Interaction effects of working and good practices on critical thinking

Because the substantive differences in the effect of work on cognitive outcomes only appeared in the measure of critical thinking, we decided to examine only critical thinking and possible conditional effects of work and good practices. The intent of this analysis is to uncover possible practices that particularly enhance the critical thinking of working students who appear to be at a deficit on the critical thinking outcome – i.e., students who work more than 10 hours per week off campus. Table 5 presents the effects of working, good practices, and the interaction of working and good practices on critical thinking.

The interaction terms suggest that many of the good practices affect working students' critical thinking differently than nonworking students. In particular, the interaction between

working more than 20 hours per week off campus and four good practice measures – cooperative learning, challenging classes and high expectations, academic challenge and effort, and frequency of higher order assessments – has a positive interaction effect on critical thinking. In other words, the differences in critical thinking between nonworking students and students who work off campus more than 20 hours per week is greatly reduced when students who work substantial hours off campus participate in cooperative learning, are challenged by faculty, are given assignments and tests that tap into higher order thinking, and put effort into their academic work.

The interaction effect of working and cooperative learning on critical thinking serves as a good example of how good practices can ameliorate the difference in critical thinking after the first year of college. See figure 1 for a graphical representation of this interaction. At low levels of cooperative learning (-1 SD), the gap in the critical thinking score between nonworking students and students who work more than 20 hours per week on campus is substantial (more than 0.20 SD). As we move toward the mean of critical thinking the gap reduces substantially. When the frequency of cooperative learning is high (1 SD), the gap is quite small, and students who work more than 20 hours per week even score slightly higher in their critical thinking. The patterns for the challenging classes and high expectations, academic challenge and effort, and frequency of higher order assessments are nearly identical to that of cooperative learning. This suggests that, while students who work a large number of hours have lower gains in critical thinking in their first year of college, the differences between nonworking students and students who work more than 20 hours per week off campus can be reduced if faculty members structure their classes in ways that encourage cooperative learning and challenge students to do their best work.

Discussion and implications

In this chapter, we sought to provide a comprehensive look at working students' experiences with faculty and the effect of work on cognitive growth after the first year of college. Our findings offer both good news and bad news about students who work. The good news is that in most cases, college student employment does not appear to affect student interactions with faculty and cognitive development negatively. Working students are not significantly different than nonworking students in terms of their beliefs about faculty interest in student development and teaching, prompt feedback, teaching clarity, and in-class challenging activities and high expectations, regardless of the numbers of hours worked and whether they work on or off campus. Students who work on campus and students who work less than 20 hours per week off campus more frequently interact with faculty off campus than nonworking students. Perhaps more promising is the fact that working students were statistically similar to nonworking students on two of our three cognitive outcomes.

However, our analysis does raise some concern for those students who work off campus more than 20 hours a week, and to some extent those who work off campus between 10 and 20 hours per week. Students who work more than 10 hours per week off campus participate less frequently in cooperative learning and are less challenged academically and put forth less effort. This group also reports lower levels of critical thinking after the first year of college, when compared with nonworking students. In addition, students employed more than 20 hours a week off campus report fewer quality interactions with faculty than unemployed students.

While these findings contribute significantly to previous research, it is still far from clear whether working enhances students' experiences with faculty or cognitive development. As with most social science research, the answer is, "it depends." It depends on what aspect of the

college experience and what outcome one examines. What these findings do suggest is that working more than 20 hours a week off campus does have a negative effect on many aspects of student interactions with faculty and their growth in critical thinking.

In terms of the critical thinking deficits accrued by working many hours off campus during the first year of college, there is some hope. If these working students engage in above average levels of cooperative learning, are challenged by their faculty, put forth above average effort, and are given assessments that tap higher order cognitive skills, the differences in critical thinking between nonworking students and students employed off campus for more than 20 hours per week all but disappear. The challenge is that on many of these measures, those working long hours in off-campus jobs are among the least likely to engage in the activities that will benefit them the most. Therefore, it is incumbent upon faculty to be creative in creating an environment that fosters the development of these working students. We outline some specific suggestions below that will particularly benefit working students but will likely enhance the learning of all students,

Faculty members are encouraged to find creative ways to engage students in cooperative learning both in and out of the classroom. Because working students may not have time to work in groups outside of class, faculty who value collaborative work are advised to structure their in-class activities in ways that get students working together. Outside the classroom, faculty might rely on technology to get students to engage in cooperative learning. Asynchronous online discussion groups or places where students can collaborate on online documents are ways to engage students and can be done at any time of the day.

It is important that faculty members set high expectations and are clear about how much effort they expect from students in their classes. Effort does not appear to be a problem isolated

to working students, but they appear to put forth less effort and it affects them differently than nonworking students. According to one national study (National Survey of Student Engagement, 2007), students spend approximately 13-14 hours per week studying, which is approximately half of what faculty believe they should. To what extent do faculty communicate these expectations and put in place procedures to assure that student are putting forth the effort they need to be successful?

Similarly, faculty would be advised to create tests and assignments that require students to synthesize, analyze, and apply the things they are learning in and out of the class. Essay assignments and exams that require students to defend an argument, apply something they have learned in class and integrate ideas across classes are all useful examples of these. Requiring students to critique assigned readings is another example of a higher order assessment. While these assignments are particularly beneficial to working students, all students will benefit from the opportunity to use higher order thinking skills.

These findings also have implications for state, federal, and institutional aid policies. With the tightening of state and federal aid to students and the shift in emphasis to merit aid over need based aid, students are increasingly reliant on income they generate while working in college. For those students who gain access to college but are forced to work long hours in an off-campus job, they have a markedly different collegiate experience than those who do not work. It seems this has a negative effect on important outcomes such as critical thinking. Aid policies that completely fill the financial gap or reduce the number of hours students must work might free up students' time to focus on their academic work. Because working on campus appears to have only a positive effect or no effect on the student experience, institutions and policymakers might find ways to grow on-campus work opportunities.

Serving students who work is likely best accomplished in a campus wide effort. Although this study focuses on student employment, all students will benefit from a campus culture that encourages faculty to engage in best practices described here. For more than a decade, scholars (see Austin, 1990, 1996; Feldman & Paulsen, 1999; Massy, Wilger, & Colbeck, 1994; Paulsen & Feldman, 1995; Umbach, 2007) have described ways to create a teaching culture and their suggestions may be instructive as we consider ways to best serve working students. For example, some suggest an emphasis be placed on teaching in faculty recruitment and hiring processes. Simple things, such as asking candidates to teach a class as part of their interview, are powerful symbols of the importance of teaching on a campus. Many institutions have faculty reward structures that place heavy emphasis on research. Colleges with a teaching culture have reward structures that more equally balance teaching and research or place greater emphasis on teaching. Some (Feldman & Paulsen, 1999; Paulsen & Feldman, 1995; Umbach, 2007) also argue that the creation or elevation of a teaching center is an important step in creating a teaching culture. Perhaps these centers could place special emphasis on how to best serve working students.

While this study provides answers to some questions regarding student employment, it leaves many questions unanswered and offers direction for future research. For example, research that explores similar constructs using a more nationally representative sample, at both the college and student level, is an important next step. This would not only allow for an exploration of part-time students, many of whom work, but would also create an opportunity to explore differences in college-level effects, such as climate and representation of working students on a campus, on the experiences of working students.

In addition to broader sampling, future research might extend the current body of literature regarding student employment by improving on the measurement of key work

variables. This study and many others rely on crude categorical measures of hours worked. The cut points used to designate hours worked in the survey data collection process are often randomly prescribed. A continuous measure would allow researchers to more fully explore nonlinear relationships between hours worked and the outcomes explored in this study and give a more complete picture of the effects of time spent working. Other studies might collect better information on the type of work students are doing and how it influences the college experience and cognitive growth. For example, do students who work in jobs that contribute to their career goals experience the same levels of development as students who do menial work?

Conclusion

This chapter tells a cautionary tale for students who work while in college and the faculty who teach working students. While the story for college students who work is not entirely bad, colleges and their faculty should be on alert that working students often experience college differently than their nonworking peers. Students who work long hours off campus might not be getting a quality educational experience and are perhaps hindering their cognitive development. There are ways to serve these students better faculty members and working students to work in concert to create a culture that enhances the likelihood of success for all students. Because an overwhelming majority of college students work, seeking ways to enrich their experience will likely become a necessity to both working students and colleges and universities.

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Table 1. Summary results of effects (represented as a proportion of a SD difference between target group and reference) of working on measures of good teaching and interactions with faculty.

Work:	Faculty interest in student dev & teaching		Teaching clarity & organization		Cooperative learning		Prompt feedback		Quality of nonclassroom interactions		Frequency of interactions		
	Model I ^a	Model II ^b	Model I ^a	Model II ^b	Model I ^a	Model II ^b	Model I ^a	Model II ^b	Model I ^a	Model II ^b	Model I ^a	Model II ^b	
<i>0 hours (reference)</i>													
On 1-10 hrs/wk	0.165 ***	0.006	0.044	-0.071	0.184 ***	0.089	0.196 ***	0.059	0.210 ***	0.056	0.288 ***	0.216 ***	
On >10 hrs/wk	-0.032	-0.086	-0.060	-0.075	-0.053	-0.062	0.025	0.018	-0.009	-0.051	0.290 ***	0.226 ***	
Off 1-10 hours/wk	-0.016	-0.038	-0.099	-0.128	0.040	0.031	0.041	0.028	0.094	0.036	0.329 ***	0.243 ***	
Off 11-20 hrs/wk	-0.011	0.020	-0.049	0.070	-0.436 ***	-0.280 ***	-0.041	0.041	0.080	0.087	0.096	0.128 *	
Off >20 hrs/wk	-0.059	-0.047	-0.010	-0.061	-0.596 ***	-0.222 **	-0.223 **	-0.156	-0.268 ***	-0.228 **	-0.202 **	-0.057	
	R ²	0.005	0.079	0.002	0.052	0.042	0.153	0.011	0.084	0.014	0.099	0.032	0.133
	N=	2,772											

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

^a Model I includes only work variables with students who do not work as reference group.

^b Model II has controls for pre-college ability (ACT/SAT), gender, race, parental education, educational aspirations, pre-college high school involvement, institutional type, living on campus, student athlete status, and greek status.

Table 2. Summary results of effects (represented as a proportion of a SD difference between target group and reference) of working on measures of academic challenge and faculty expectations.

Work:	Challenging classes & high expectations		Academic challenge & effort		Frequency of higher-order assessments		
	Model I ^a	Model II ^b	Model I ^a	Model II ^b	Model I ^a	Model II ^b	
<i>0 hours (reference)</i>							
On 1-10 hrs/wk	0.190 ***	0.034	0.135 **	0.045	0.161 **	0.041	
On >10 hrs/wk	-0.013	-0.039	-0.012	-0.010	0.116	0.031	
Off 1-10 hours/wk	-0.034	-0.043	0.005	-0.066	0.124	0.048	
Off 11-20 hrs/wk	-0.185 **	-0.087	-0.277 ***	-0.164 *	-0.040	-0.097	
Off >20 hrs/wk	-0.187 *	0.034	-0.510 ***	-0.254 **	0.392 ***	0.383 ***	
	R ²	0.01	0.078	0.026	0.159	0.013	0.073
	N= 2,772						

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

^a Model I includes only work variables with students who do not work as reference group.

^b Model II has controls for pre-college ability (ACT/SAT), gender, race, parental education, educational aspirations, pre-college high school involvement, institutional type, living on campus, student athlete status, and greek status.

Table 3. Summary results of effects (represented as a proportion of a SD difference between target group and reference) of working on cognitive development after the first year of college.

Work:	Need for cognition		Positive attitude toward literacy		Critical thinking		
	Model I ^a	Model II ^b	Model I ^a	Model II ^b	Model I ^a	Model II ^b	
<i>0 hours (reference)</i>							
On 1-10 hrs/wk	0.131 **	-0.053	0.250 ***	0.048	0.157 *	0.007	
On >10 hrs/wk	-0.017	-0.012	0.172 **	0.135 **	-0.037	0.079	
Off 1-10 hours/wk	-0.215 **	-0.048	0.033	0.015	-0.411 ***	-0.080	
Off 11-20 hrs/wk	-0.352 ***	-0.051	-0.081	0.026	-0.779 ***	-0.159 **	
Off >20 hrs/wk	-0.190 **	-0.104	-0.208 **	-0.030	-1.088 ***	-0.154 *	
	R ²	0.131	0.756	0.123	0.755	0.346	0.844
	N	2,772	2,772	2,772	2,772	1,336	1,336

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

^a Model I includes only work variables with students who do not work as reference group.

^b Model II has controls for outcome pre-test, pre-college ability (ACT/SAT), gender, race, parental education, educational aspirations, pre-college high school involvement, institutional type, living on campus, student athlete status, and greek status.

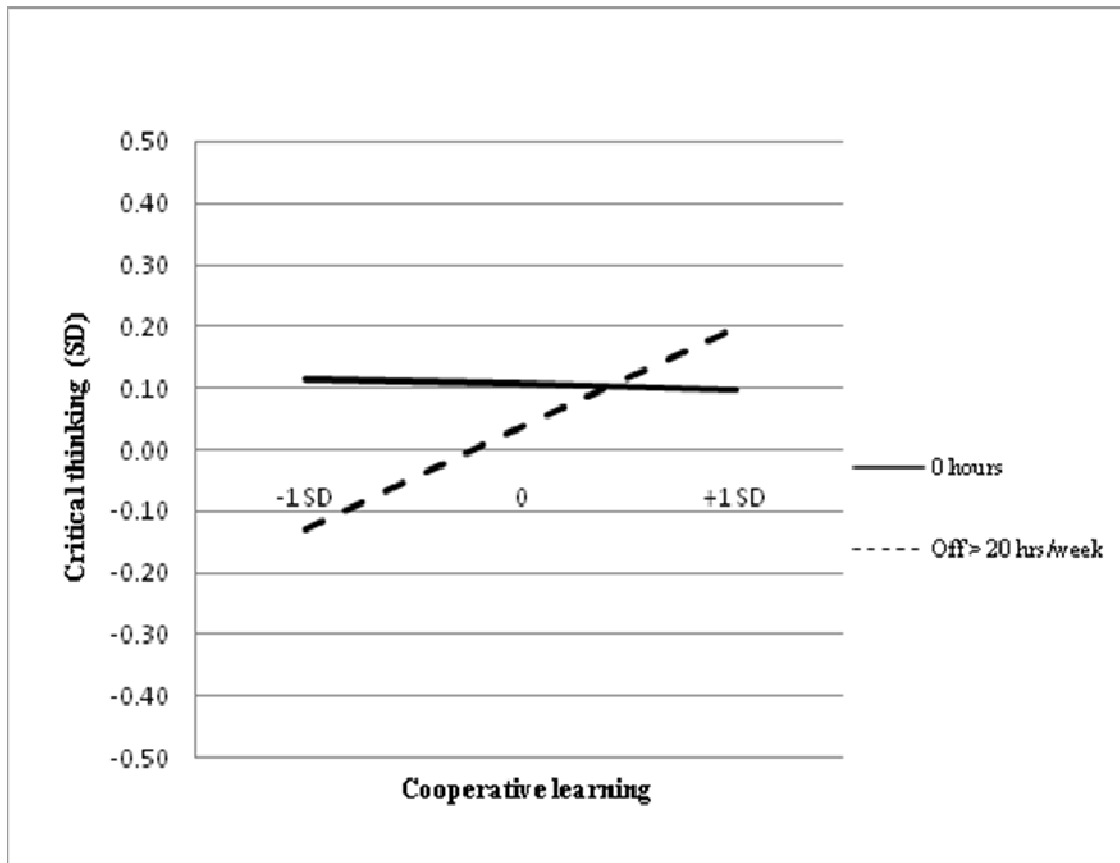
Table 5. Summary results of effects of work, good practices, and interaction of work and good practices on critical thinking

	Faculty interest dev & teaching	Teaching clarity & organization	Cooperative learning	Prompt feedback	Quality non- classroom interactions	Frequency of interactions	Challenging classes/high expectations	Academic challenge & effort	Frequency of higher-order assessments
Work:									
<i>0 hours (reference)</i>									
On 1-10 hrs/wk	0.005	0.001	0.005	0.007	-0.001	0.016	0.000	-0.002	0.001
On >10 hrs/wk	0.072	0.067	0.056	0.081	0.086	0.087	0.057	0.051	0.078
Off 1-10 hours/wk	-0.084	-0.061	-0.071	-0.083	-0.073	-0.067	-0.047 *	-0.062	-0.080
Off 11-20 hrs/wk	-0.154 **	-0.166 **	-0.158 **	-0.160 **	-0.154 **	-0.153 **	-0.151 **	-0.150 **	-0.173 **
Off >20 hrs/wk	-0.169 *	-0.168 *	-0.072	-0.143 *	-0.127 *	-0.143 *	-0.131 *	-0.078	-0.174 *
Good practice	0.056 *	0.051 *	-0.008	0.014	0.03	-0.015	0.019	0.007	-0.038
Interaction: Good practice x work									
On 1-10 hrs/wk	-0.056	0.023	-0.005	0.001	-0.087	-0.022	-0.052	-0.015	-0.007
On >10 hrs/wk	-0.052	-0.081	-0.107	0.016	-0.011	-0.063	-0.085	-0.084	-0.003
Off 1-10 hours/wk	-0.053	0.176 ***	0.044	0.096	0.157 ***	-0.072	0.233 **	0.215 ***	0.201 ***
Off 11-20 hrs/wk	0.031	0.001	0.012	0.056	0.015	-0.037	0.004	0.029	-0.069
Off >20 hrs/wk	-0.115	-0.003	0.172 ***	0.025	0.086	-0.03	0.100 *	0.135 *	0.180 **
	R ² 0.845	0.848	0.847	0.845	0.847	0.845	0.848	0.847	0.848

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

^a Model has controls for outcome pre-test, pre-college ability (ACT/SAT), gender, race, parental education, educational aspirations, pre-college high school involvement, institutional type, living on campus, student athlete status, and greek status.

Figure 1. Interaction effect of working and cooperative learning on critical thinking



Appendix A - Description of variables used in models

Variable	Description	Alpha reliability	Mean	SD
Interactions with faculty and good teaching				
Faculty interest in teaching and development	This 5-item scale measures student perceptions of faculty interest in teaching and student development. The questions in this scale ask students the extent to which they agree that most faculty with whom the respondent had contact with: Are genuinely interested in students; are interested in helping students grow in more than just contact areas; are outstanding teachers; are genuinely interested in teaching; are willing to spend time outside of class to discuss issues of interest and importance to	0.85	0.000	1.000
Teaching clarity and organization	This 10-item scale measures the frequency with which students are exposed to clear and organized instruction. The items included in this scale ask how frequently: Faculty gave clear explanations; faculty made good use of examples and illustrations to explain difficult points; faculty effectively reviewed and summarized material; faculty interpreted abstract ideas and theories clearly; faculty gave assignments that helped in learning the course material; presentation of material was well organized; faculty were prepared for class; class time was used effectively; course goals and requirements clearly	0.89	0.000	1.000
Cooperative learning	A 4-item scale that measures the extent to which student engage in cooperative learning. Items included in this scale ask the student how frequently: In respondent's classes, students taught each other in addition to faculty teaching; faculty encouraged the respondent to participate in study groups outside of class; respondent participated in one or more study group(s) outside of class; and during current school year, how often the respondent worked with other students on projects outside of class.	0.70	0.000	1.000
Prompt feedback	This 3-item scale measures how promptly faculty give feedback to students. The items include how often: Faculty informed the respondent of their level of performance in a timely manner; faculty checked to see if the respondent had learned the material well before going on to new material; respondent received prompt written or oral feedback from faculty regarding	0.68	0.000	1.000
Quality of nonclassroom interactions	This 5-item scale measures the quality of interactions students have with faculty. The questions that make up this scale ask students the extent to which they agree that: Non-classroom interactions with faculty have had a positive influence on personal growth, values, and attitudes; non-classroom interactions with faculty have had a positive influence on intellectual growth and interest in ideas; non-classroom interactions with faculty have had a positive influence on career goals and aspirations; since coming to this institution, the respondent has developed a close, personal relationship with at least one faculty member; satisfied with the opportunities to meet and interact informally with faculty members.	0.85	0.000	1.000
Frequency of interactions	This 4-item scale measures the frequency that students interact with faculty members. The items included in the scale are how frequently the student: Discussed grades or assignments with an instructor; talked about career plans with a faculty member or advisor; discussed ideas from readings or classes with faculty members outside of class; and worked with faculty members on activities other than coursework (committees, orientation, student life activities, etc.).	0.70	0.000	1.000
Challenging classes and high expectations	This 6-item scale measures the extent to which students are challenged in the classroom and faculty hold high expectations. The scale includes how frequently: Faculty asked challenging questions in class; faculty asked the respondent to show how a particular course concept could be applied to an actual problem or situation; faculty asked the respondent to point out any fallacies in basic ideas, principles, or points of view presented in the course; faculty asked respondent to argue for or against a particular point of view; faculty challenged the respondent's ideas in class; students challenged each others ideas in class.	0.82	0.000	1.000
Academic challenge and effort	This 11-item construct measures the extent to which students are challenged by and put forth effort in their academic work. The items include: the number of textbooks, books, or book-length packs of course readings read; number of written papers or reports between 5 and 19 pages; number of problem sets that take more than an hour to complete; extent to which exams challenged to do best work; number of hours per week spent studying; extent to which institution emphasizes spending significant amounts of time studying; how often contributed to class discussions; how often made a class presentation; how often prepared two or more drafts of a paper before turning it in; how often came to class without completing readings or assignments (reverse-coded); how often worked harder than thought could to meet instructors standards/expectations.	0.65	0.000	1.000
Frequency of higher-order assessments	This 6-item scale measures the extent to which faculty give students exams and assignments that tap higher-order thinking. The items include the frequency that faculty give exams or assignments that required the respondent: to write essays; to use course content to address a problem not presented in the course; to compare or contrast topics or ideas from a course; to point out the strengths and weaknesses of a particular argument or point of view; to argue for or against a particular point of	0.76	0.000	1.000

Variable	Description	Alpha reliability	Mean	SD
Cognitive outcomes				
Positive attitude toward literacy	This 6-item scale measures students' enjoyment of such literacy activities as reading poetry and literature, reading scientific and historical material, and expressing ideas in writing.	0.71	0.000	1.000
Need for cognition	The 18-item Need for Cognition Scale (NCS). Need for cognition refers to an individual's "tendency to engage in and enjoy effortful cognitive activity" (Cacioppo, Petty, Feinstein, & Jarvis, 1996, p. 197). Those who have a high need for cognition "tend to	.83-.91	0.000	1.000
Critical thinking	The critical thinking module from the Collegiate Assessment of Academic Proficiency (CAAP) developed by the American College Testing Program (ACT) is a 40-minute, 32-item instrument designed to measure a student's ability to clarify,	.81-.82	0.000	1.000
Work variables				
On 1-10 hrs/wk	Student works between 1 and 10 hours per week on campus (1=on campus work 1-10 hours/week, 0=all else)		0.278	0.448
On >10 hrs/wk	Student works more than 10 hours per week on campus (1=on campus work more than 10 hours/week, 0=all else)		0.099	0.299
Off 1-10 hours/wk	Student works between 1 and 10 hours per week off campus (1=off campus work 1-10 hours/week, 0=all else)		0.082	0.275
Off 11-20 hrs/wk	Student works between 11 and 20 hours per week off campus (1=off campus work between 11 and 20 hours/week, 0=all else)		0.060	0.238
Off >20 hrs/wk	Student works more than twenty hours per week off campus (1=off campus work more than 10 hours/week, 0=all else)		0.035	0.184
Control variables				
Greek	Member of a greek organization (Greek member=1, non-Greek=0)		0.134	0.340
Athlete	Varsity athlete (athlete=1, non-athlete=0)		0.149	0.356
Lives on campus	Resides on campus (1=on-campus residence, 0=off-campus residence)		0.883	0.322
Institution: CC	Student attends a community college (1=community college, 0=all else)		0.042	0.201
Institution: Master's	Student attends a regional/master's granting university (1=master's, 0=all else)		0.165	0.371
Institution: Doctoral	Student attends a doctoral/research university (1=doctoral, 0=all else)		0.264	0.441
Male	Gender (male=1, female=0)		0.347	0.476
Precollege academic ability	Pre-college standardized test score converted to an ACT composite score		0.000	1.000
Advanced degree	Student plans to obtain an advanced degree (e.g., M.D., J.D., Ph.D., M.B.A). Coded as 1=advanced degree, 0=bachelor's		0.790	0.407
High school involmnet	A seven-item scale that measures involvement during last year in high school. Constituent items include how often study with a friend, how often socialize with friends, how often talk with teachers outside of class, how often participate in community ser	0.58	0.000	1.000
First-generation college	Neither parent earned a college degree (1=first-generation, 0=all else)		0.257	0.437
African American	Race/ethnicity African American (1=African American, 0=all else)		0.049	0.217
Asian Pacific Islander	Race/ethnicity Asian Pacific Islander (1=Asian Pacific Islander, 0=all else)		0.072	0.258
Latino/a	Race/ethnicity Latino/a (1=Latino/a, 0=all else)		0.056	0.230
Race other	Race/ethnicity "other" (1=other race/ethnicity, 0=all else)		0.024	0.153
Positive attitude toward literacy (pre-test)	See above for description	0.71	0.000	1.000
Need for cognition (pre-test)	See above for description	.83-.91	0.000	1.000
Critical thinking (pre-test)	See above for description	.81-.82	0.000	1.000