

Job satisfaction among Mexican alumni: a case of incongruence between hunch-based policies and labor market demands

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Abstract Like many other public Mexican universities, the Benemérita Universidad Autónoma de Puebla (BUAP) has tried to contribute to the national development of Mexico by offering new undergraduate majors presumed to be better attuned to the needs of the labor market, while capping enrollments in traditional majors presumed to be redundant. Using data from one of the most extensive alumni studies in Mexico, we found that BUAP alumni who graduated in traditional majors do not show high unemployment or low satisfaction. On the contrary, the lowest levels of job satisfaction and the highest rates of unemployment are found among the graduates of non-traditional majors.

Keywords Alumni research · International higher education · College majors

Introduction

Bachelor degree offerings in Mexican universities have roughly followed three trends that we can characterize as: (a) traditional (up to 1960s), (b) scientific (1960s–1970s),

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and (c) novel (1990s–2000s). Each trend correlates with unique political and economic circumstances that connect to particular beliefs about what majors public universities should offer. For example, the last wave of majors, created in the 1990s, rests on a widely accepted assumption that traditional majors are saturated, and that novel options are needed to respond to new sectors in the labor market, the development needs of the country, or the imminent arrival of a new economy based on technology and information (CEPAL-UNESCO 1992; Gago 1989).

Even though the creation and operation of majors is costly, there is virtually no information about the influence these three types of majors have on their graduates' success in the labor market (Muñoz 1996). In fact, next to nothing is known about college graduates in Mexico (ANUIES 2000). Nonetheless, this lack of information has not prevented the federal government and most public universities from endorsing policies aimed at diverting student flows from traditional majors towards new options since the late 1980s.

In this paper, we use data from one of the most extensive alumni studies in Mexico, conducted by the Benemérita Universidad Autónoma de Puebla (BUAP) in 2005–2006, to test the policy assumption that traditional majors prepare for a bleak future. While several measures can be used to examine the impact of majors, we decided to focus our attention on job satisfaction. As noted by Vila, García-Aracil and Mora (2007), job satisfaction is an excellent measure of success. Job satisfaction reflects non-monetary and monetary returns for graduates from particular majors (Wolniak and Pascarella 2005). If educational policy assumptions are accurate, we should expect to see that monetary and non-monetary rewards would flow to those who pursued undergraduate majors that are perceived more attuned to the needs of the labor market. The end result of these policies should be apparent by a distribution of job satisfaction in which lower levels of job satisfaction would be found among graduates of traditional majors, slightly better results for those majoring in undergraduate programs created in the 1960s–1970s, and higher levels for graduates from majors established in the 1990s.

Research and policy problem

Public policies and institutional reforms in Mexico over the last two decades have rested on the belief that traditional majors are saturated, generating unemployment or forcing their graduates to accept jobs which are incongruent with their college majors (World Bank 1994; Coombs 1991). To address this problem, the federal government enacted a number of policies aimed at creating new majors, while encouraging prospective students to pursue the innovative baccalaureate degrees that began to be offered in the early 1990s (Acosta 1999; ANUIES 2001).

As noted by Acosta (1999), Mexican universities, like their Latin American counterparts, are institutions with peculiar histories and traditions that need to be taken into account to explain changes in their operation and missions (Schwartzman 1996). Accordingly, we decided to separate the different majors into three groups: traditional (created by 1960s), scientific (created 1960s–1970s) and novel (created 1990s–2000s).

The “traditional” type of majors is at the heart of the origin of Latin American public universities (Brunner 1991). Typically, universities were created by organizing several small professional colleges into one bigger institution. These universities attended to the educational needs of local elites, and the majors offered led to traditional professions: Law, Medicine, Accountancy, Architecture, and Engineering. In doing so, the universities

followed the European model, based on specialized, long term programs¹ that license graduates to practice their profession. Most faculty members were practitioners, teaching only a few hours a week (De Moura Castro and Levy 2000; Gil 1994; Levy 1986).

A second group developed in the 1960s–1970s and can be typified as “scientific”. During these decades, universities started to model themselves after European and North American institutions, creating majors in the sciences and humanities (Gil 2000). Majors such as Physics, Chemistry, History and Philosophy appeared in the catalogues. This period also saw the emergence of research institutes, most of which specialized in pure scientific research (Vessuri 1997; Rodriguez 1999). The emergence of the professoriate as a professional occupation also took place around this time (Gil 1994; ANUIES 2000). Changes in the mission of the universities and their major offerings unfolded under a background of rapid enrollment growth. Undergraduate student numbers increased from over 209,000 in 1970 to 850,000 in 1980, reaching 1.2 million by 1990 (ANUIES 2000).

In the 1990s, a third wave of majors took place, which we typify as “novel”. Majors such as International Relationships, Environmental Engineering, Computer Sciences, and Commerce mushroomed across the Mexican postsecondary landscape. This emphasis on offering technological or vocational majors rested on the notion that traditional majors were saturated, leading to underutilization of their graduates, if not unemployment altogether (Gago 1989).

The saturation of traditional majors in the labor force became a widely accepted belief, an assumption backed by international and national reports. Invited by the Mexican Federal Government in 1990, the International Council for Educational Development (ICED) conducted an evaluation of the Mexican higher education system. The ICED concluded that too many students were concentrated in traditional majors leading to the underutilization of college graduates (Coombs 1991). This conclusion was later endorsed by the Organization for Economic Cooperation and Development (OECD) in 1995. Subsequent studies by the World Bank and the Interamerican Development Bank reached similar conclusions (World Bank 1994; IDB 1997). In particular, the OECD report placed special emphasis on the need to increase and diversify postsecondary major options, with a particular emphasis on technical fields (OECD 1997). Prior to these international reports, changes in undergraduate major policies had also been endorsed by Mexican organizations (CONPES 1986).

Mexican public officers reached the conclusion that the crisis of public higher education was indeed partly due to the unrestricted intake of students during the 1970s and 1980s, and to the lack of response to the needs of the labor market (Gago 1989). In particular, the increase of enrollments in traditional majors was seen as one of the causes of unemployment among college graduates, while, at the same time, other majors, deemed crucial for national development, were perceived to be in short supply (de Vries 2002). The remedy seemed clear: the new majors, as in the case of developed countries, would be better attuned to the demands of the “emerging knowledge society” (CEPAL-UNESCO 1992; UNESCO 1999; de Vries 2001).

National and state politicians also began arguing in favor of adopting enrollment caps in traditional professions such as law, medicine, administration, accountancy and civil engineering as a mechanism to divert enrollments towards majors perceived to be in short

¹ Following the traditional European model, these majors take 5 or 6 years to finish, and were conceived as programs that prepare directly for the labor market. Postgraduate studies, following the US model, were later introduced on top of this traditional structure. It should be noted that the later waves of programs followed the same form of organization.

supply. The justification for this educational strategy followed through the 1990s was captured best in a 2003 interview with the Mexican Undersecretary for Higher Education, Mr. Julio Rubio.

...turning away college applicants [by public universities] is due to the fact that many [of them] want to study saturated programs, like medicine, law, or administration... higher education institutions should create pertinent majors, as organizations like the UNESCO recommend” (La Jornada, July 30, 2003).

Public discourse led to action. In 1996, the federal government enacted the National Plan for Education 1995–2000 (SEP 1996). The National Plan for Education² asked public universities to create new options and to better balance enrollment distribution among disciplines. Most public universities followed suit by adopting enrollment caps and college entrance exams (Acosta 2000; de Vries 2002). Universities were also invited to create new majors and received additional financial aid to do so.³ Rapid diversification of majors soon followed. Whereas most public universities offered about 20 majors in 1990, by 2005 almost all offered more than 40 majors (ANUIES 2005).

Evidence seems to question the effectiveness of public enrollment policy. The distribution of students across majors has remained practically unchanged. Consider the case of social sciences for instance. In 1990, almost 50% of the enrollment was accounted for by such traditional majors as law, administration and accountancy. Twelve years later, enrollment in these majors continued to represent 48% of the total enrollment in higher education (ANUIES 2003a, b). Far from altering the distribution of students across majors, the capping enrollment policy actually altered the public-private enrollment distribution by turning away prospective college students from the public sector to the private sector. In 1990, enrollment in the private sector accounted for 17% of the total enrollment. In 2005, 35% of the total undergraduate student population was enrolled in the private sector (ANUIES 2003a, b).

Little is known as to the fate of those college graduates who majored in the new fields of study. As the ANUIES pointed out in 2000, there are practically no reliable and valid data on alumni (ANUIES 2000). This study seeks to address this need by documenting differences in job satisfaction among graduates of different majors using data from the Benemérita Universidad Autónoma de Puebla (BUAP). If government predictions were accurate, we should expect to find higher levels of job satisfaction among college graduates of the new majors as compared to those who pursued traditional majors.

Job satisfaction in the literature

Job satisfaction has been examined under different lenses, including economics (Vilas 2000), industrial psychology (Hackman and Oldham 1975, 1980) and theories of vocational choice (Holland 1997). This literature reveals several factors tied to job satisfaction.

² The federal government created an entirely new sector postsecondary education sector in the form of Technological Universities (TU) which offers 2-year vocational degrees. More than 80 of these TUs were created between 1992 and 2002, with the overt intention to draw students away from traditional university majors (Villa and Flores 2002).

³ The federal government created several special funds in the early 1990s. One of them is explicitly called “Ampliación de la oferta”, or “broadening of major supply”. Other funds have had indirect impact, such as a fund to train and hire full-time faculty with a PhD, or the flow of research monies, mainly benefiting scientific or novel majors.

Those include income, years of schooling (Cohn and Addison 1998), the characteristics associated with the job itself (Locke and Latham 1990), personal characteristics of the job holder (Blackburn and Bruce 1989), the degree of match between a job holder's personality type and her or his work environment (Elton and Smart 1988). Other factors include the level of congruence between college major and the job (Kressel 1990; Vila and García-Mora 2005; Wolniak and Pascarella 2005), the economic sector where the job is located (De Santis and Durst 1996), and the type of job held (Karl and Sutton 1998; Vila and García-Mora 2005).

Economic perspective

Adherents of the human capital perspective seek to explain job satisfaction in terms of returns of investment an individual secures when becoming qualified to enter the labor force (Bowen 1977). Extending schooling is seen as the means to enhance an individual's relative position in the labor market. Better job opportunities and freedom to choose among employers and economic sectors would be available to those who obtain higher levels of education (Thurow 1979). Schooling empowers an individual by equipping him or her with better skills to secure information, making better choices and having the competencies to perform complex and better paying jobs (Arrow 1997; Vila and García-Mora 2005). While economists' initial attention was placed on income and employment stability, the intangible benefits of education have also gained their interest. Feelings of well being and being job satisfied are two of the intangible benefits now under examination (e.g., Oswald 1997; Veenhoven 1996; Vila 2000). Using human capital principles, Vila and García-Mora (2005) argue that the connection between education and job satisfaction can be traced to "better-matched preferences on non-pecuniary aspects of the...working activity" (p. 409). In their view, job satisfaction takes place when educated individuals can access jobs with motivating and challenging tasks being performed under stable and pleasant working conditions.

As far as the role of income on job satisfaction, the positive connection is well documented (Pascarella and Terenzini 2005). Using alumni survey data of 2,515 graduates from 30 American postsecondary institutions, Wolniak and Pascarella (2005) found that income had both direct and indirect effects on three key domains of satisfaction: job autonomy, personal fulfillment and financial characteristics. The nexus between income and job satisfaction transcends borders, as demonstrated by Vila, García-Aracil and Mora (2007). Using alumni data from over 30,000 European graduates, the authors found a significant effect of wages on job satisfaction.

Unlike research on the income-job satisfaction connection, economic studies on the relationship between college-based qualifications and job satisfaction are scarce and have yielded mixed results (Vila and García-Mora 2005). Based on a survey of Oregonian employees from 18 manufacturing and warehouse companies, Hersch (1991) found a negative association between having college-based qualifications and job satisfaction. Clark (1996) also noted a negative relationship among British workers. On the other hand, Vila and García-Mora (2005), while examining a representative sample of Spanish employees, reported opposite results. As noted by Vila and García-Mora, contradictions in the literature can be explained by the way the degree of match between the employee's qualifications and the job requirements has been measured. For instance, Hersch (1991) and Clark (1996) examined the effects of being overqualified on job satisfaction. In contrast, Vila and García-Mora added perceptions of congruence between education and employment. In doing so, they noticed that perceptions of being overqualified had a

negative effect on job satisfaction, while being able to use preparation obtained in college in the current job led to high levels of satisfaction.

Industrial psychology perspective

Since the 1950s, industrial psychologists have examined the extent to which characteristics of the job itself bear a connection with job satisfaction (Dunham 1984). The main difference between industrial psychology and the economic perspective lies in the mechanism that prompts job satisfaction. From an economic perspective, job satisfaction is the outcome of maximizing an individual's utility function in which monetary and non-monetary gains result from a variety of work-related outcomes such as "... performing interesting tasks, holding a responsibility level matched to worker's qualifications, working under healthier or more attractive conditions, [and] having greater independence..." (Vila and García-Mora 2007, pp. 409–410). Industrial psychologists (Robbins 1997), on the other hand, emphasize the connection between intrinsic and extrinsic rewards associated to a particular job and the individual needs of the job holder himself/herself. In the late 1950s, Herzberg et al. (1957) argued that employees seek to satisfy two sets of needs in the employment context: 'hygiene' (pain-avoidance) needs and 'growth' or motivational needs. Addressing each of these two domains leads to two different psychological states. Job dissatisfaction is presumed to take place when salary, working conditions, fringe benefits and relationships with peers and supervisors fail to address an employee's hygiene needs. Motivation and job satisfaction, on the other hand, arise when there are opportunities for promotion and the work itself is meaningful as to allow the job holder to experience a sense of accomplishment. In expanding Herzberg and associates' dualistic approach to job-related satisfiers and dissatisfiers, Hackman and Oldham's (1975, 1980) job characteristics theory placed particular emphasis on the motivational nature of the dimensions that make up the job itself and its connection with the psychological needs of the employee. They postulated that a job's intrinsic motivating factors fall into five core dimensions: (1) skill variety, (2) task identity, (3) task significance, (4) autonomy, and (5) feedback. They argued that the employee's critical psychological states fall into three domains: (1) experiencing meaningfulness of the work, (2) experiencing responsibility for outcomes of the work, and (3) knowledge of the actual results of the work activities. Given these factors, satisfaction is seen as a question of congruence. From the industrial psychology view, congruence takes place when the job incumbent needs' for autonomy and responsibility are matched by jobs whose tasks are varied and meaningful while granting a fair amount of autonomy and discretion.

In their comprehensive review of the literature on job satisfaction, Locke and Latham (1990) conclude that research has largely validated the connection between job satisfaction and intrinsic job characteristics, much in line with the Hackman and Oldham's (1980) job characteristics model. A high degree of job satisfaction takes place when the job is comprised by clear and complex tasks that allow the job holder to use his or her skills and abilities while being able to judge the impact of their performance on the organization and its clientele (Hackman and Oldham 1980; Locke and Latham 1990; Locke et al. 1983). Locke and Latham also noticed that the nature of the job position seems to correlate with core job dimensions as well. Satisfaction with *work itself* has been particularly high among white collar positions such as managerial jobs, independent employees, and college professors (e.g., Chiu and Chen 2005; Gómez-Mejía and Balkin 1984; Locke et al. 1983; Locke and Latham 1990; Olsen et al. 1995; Smerek and Peterson 2007).

The economic sector (e.g., public, private, service, manufacturing) also correlates with overall levels of satisfaction and explains what employees value from the jobs. De Santis

and Durst (1996), using data from a 1982 national sample full time workers, noted that public employees were more satisfied than their private counterparts. Karl and Sutton (1998) added that public employees valued *interesting work* the most, while employees in the private sector ranked *good wages* the highest while examining survey data gathered among full-time Midwestern workers drawn from a wide-range of industries and occupations.

Vocational psychology perspective

Unlike the economic and industrial psychology theories, the vocational psychology perspective seeks to explain the connection between college experiences and such work-related outcomes as job satisfaction (Holland 1997). It does so by examining the level of congruency between the personality, vocational interests and competencies of the individual and the major pursued in college (Spokane et al. 2000). As in the case of industrial psychology, the vocational approach also sees job satisfaction as the outcome of the successful match or congruence between the individual and the work environment. However, it regards the major itself to be the embodiment of a college graduate's vocational preferences and competencies whose match with the work environment would lead to successful or unsuccessful working experiences. The closer the level of congruence between one's major and the work environment, the higher job satisfaction would be (Smart et al. 1986; Elton and Smart 1988; Fricko and Beehr 1992; Wolniak and Pascarella 2005).

Scholars seeking to establish the connection between major and the work environment have measured congruence in two ways: objective and subjective. Some objective measures are based on intended major as a freshman, major chosen and type of occupation (e.g., Elton and Smart 1988; Wolniak and Pascarella 2005). Others (e.g. Fricko and Beehr 1992) rely on standardized instruments such as the Strong Campbell Interest Inventories (SCII). On the other hand, subjective measures capture self-reported perceptions of the extent to which the job was related to the undergraduate major (Smart et al. 1986; Wolniak and Pascarella 2005; Fricko and Beehr 1992).

Research supports the congruence-job satisfaction connection. Using the Cooperative Institutional Research Program (CIRP) data following college students' 5-year post graduation from 487 colleges and universities, Smart et al. (1986) found a significant association between job satisfaction and perceived level of congruence between current job and undergraduate major. Smart and associates also noted that the congruence-job satisfaction varied by the intrinsic and extrinsic dimensions of the job. Higher adjusted satisfaction means were reported for both men and women across congruence levels among intrinsic job characteristics (e.g. creativity, use of training, decision making power, responsibility) than among extrinsic job-related factors (e.g. fringe benefits, pay). In a replication study, based on an objective measure of congruence while focusing on job satisfaction with extrinsic factors among college students' 9-years post graduation, Elton and Smart (1988) noted that alumni holding job positions at the highest congruence level with their college majors were more satisfied with income, fringe benefits, promotion opportunities and job security than alumni holding job positions at the lower end of the congruence scale. Likewise, Fricko and Beehr (1992), using data from 253 fully employed college graduates from a single institution, found that college major-job congruence was related to job satisfaction. Fricko and Beehr, however, noted that the congruence-job satisfaction relationship was sustained irrespective of whether congruence was measured via objective methods (e.g., Strong-Campbell Interest Inventory) or assessed via perceptions regarding the extent to which the job was congruent with their college major.

In summarizing major-job congruence studies and two-meta analyses of congruence research conducted between 1985 and 1999, Spokane et al. (2000) concluded that congruence is a 'sufficient but not a necessary condition for job satisfaction...' (p. 137). In support of this conclusion, Spokane and his colleagues noted several methodological pitfalls including: lack of longitudinal research design, omission of important predictors of job satisfaction and absence of multiple measures of job satisfaction and congruence. Recently, Wolniak and Pascarella (2005) addressed many of these deficiencies. Their study controlled for background characteristics when examining the direct and indirect effects of income, college major and two congruence measures (objective and subjective) on three facets of job satisfaction (autonomy, personal fulfillment from the job and financial job-characteristics). Their study also followed a longitudinal research design whereby college experiences were matched with job experiences 25 years after completion of the baccalaureate degree. In doing so, Wolniak and Pascarella found that degree major and congruence had direct effects on job satisfaction while mediating the impact of income on job satisfaction. Moreover, the connection between congruence and job satisfaction was found to vary by job dimension whereby congruency predicted such intrinsic job satisfaction components as autonomy and personal fulfillment, a finding which is consistent with Smart et al. (1986). In contrast to the Fricko and Beehr (1992) study, however, the Wolniak and Pascarella study found that the effect of congruence on job satisfaction varied in terms of how congruence was measured. The objective measure of congruence was found to have either no significant or even negative effects. The opposite was noted for the subjective congruence measure. The type of major was also found to have both direct and indirect effects on job satisfaction. Such connection seems to hold not only in the USA but in Europe as well (Vila et al. 2007).

Summary of findings

Although studies seeking to determine the relationship between college-preparation and job satisfaction have followed different perspectives and produced mixed results, all these lines of research converge in noting a series of factors that matter in job satisfaction. Intrinsic job-related factors such as autonomy, work itself and skills variety are valued most by college educated workers. Income is also important in explaining college graduates' job satisfaction. Income and job satisfaction are the by-product of the degree of congruence between major pursued and the nature of the work done. Both the economic perspective and the vocational perspective have documented the moderating role congruence has on income and job satisfaction. We also know that job satisfaction is impacted by a series of personal characteristics such as age, gender and ethnicity, which could be more important than working conditions (Kalleberg 1977; Kalleberg and Loscocco 1983; Blackburn and Bruce 1989). As to gender, a certain paradox is noted by research conducted in several countries; women report being more satisfied with their job, even when they tend to receive inferior pay (Clark 1997; Kaiser 2005). These findings guided the selection of factors in our analysis of job satisfaction among BUAP graduates.

Methodology

Background

The Benemérita Universidad Autónoma de Puebla (BUAP) is located in the state of Puebla, 80 miles southwest of the state of Mexico and Mexico City. The state of Puebla

has a population of 5 million and enjoys a highly diversified economy ranging from tourism, to textiles, to steel industry, to the automotive industry. In terms of Gross Domestic Product, Puebla ranks number four in the country, after Mexico City, Monterrey and Jalisco (INEGI 2006). The state of Puebla also boasts one of the largest concentrations of institutions of higher education. In 2006, there were 205 colleges and universities in Mexico City. The state of Puebla had 193 (SEP 2007).⁴ The BUAP is the largest institution of higher education in the state of Puebla, accounting for 36% of undergraduate student enrollment (BUAP 2004; ANUIES 2003a, b).

In 1990, the university accounted for over 80% of the total enrollment in the state of Puebla, with a catalogue listing 25 majors. No college entrance exam was required and students were free to choose their undergraduate majors. Enrollment in traditional majors such as law, accountancy, medicine, administration and civil engineering comprised 53% of the total enrollment (ANUIES 1990; BUAP 1993).⁵

In 1994, the BUAP asked the International Council for Educational Development (ICED) to evaluate its undergraduate education system. The ICED (1994) recommended enrollment caps for traditional majors, linked to an entrance exam, and the creation of new major offerings much in line with prior recommendations given to the federal government in 1990.

The BUAP eagerly embraced the ICED's recommendations and became a model for institutional reform (Acosta 1999; Ornelas 2002). Admissions into traditional majors were capped. Between 1990 and 2004, total enrollment in law decreased from 11,419 to 2,638, in accountancy from 10,884 to 2,956 and in medicine from 7,696 to 2,693 (BUAP 2004). Concomitantly, the BUAP created new majors such as communications, business administration, urban development, graphic design, industrial engineering, international relations and tourism administration, perceived to address the needs of the labor market. As a result of enrollment capping policies in traditional majors, total undergraduate enrollment in the BUAP decreased from 50,000 in 1990 to 35,131 in 2004, a decline of nearly 30%.

Subjects

The data are based on information provided by 3,050 BUAP alumni corresponding to the entering freshman classes of 1997, 1998 and 1999. The alumni survey data were gathered by a poll company via personal interviews carried out during the winter of 2005–2006. Alumni were randomly selected by cohort and major. Survey data were matched with college records.

Possible bias was controlled for in several ways: interviews were carried out by home visits, as postal services are unreliable and Internet access is still limited to a small number of Mexicans. The interview process was conducted by a private poll company to avoid biases introduced when the universities themselves conduct alumni surveys (Porter 2004). The response rate accounts for about 53% of the target sample. Our analyses are restricted

⁴ Estimating the exact number of institutions and majors in Mexico is troublesome. Majors can be authorized and registered by the federal government, the state government or autonomous public universities. Several private universities have also set up branch campuses all over the country, but are counted as one. Not surprisingly, estimates vary across different official documents.

⁵ It is important to note that data on enrollments from the 1980s and early 1990s for most Mexican public universities are highly unreliable. Public universities had adopted the practice of overestimating enrollment figures in order to secure higher public subsidies. The BUAP was not an exception to this practice. In 1990, the BUAP reported a total enrollment of 75,000 students. In 1993, the BUAP reduced this estimate to 50,000 students.

to those graduates who were employed at the time the interview took place and who had not pursued or completed a degree beyond the baccalaureate. These criteria yielded a total of 2,270 alumni.

Conceptual framework

The college major-job satisfaction model (Wolniak and Pascarella 2005) and the Vila et al. (2007) College Graduate Job Satisfaction model guided the selection of the variables in this study. Accordingly, measures selected for this study included: major-job field congruence, waves of college majors, personal characteristics, type of job held, type of economic sector, and income. Consistent with Smart et al. (1986) job satisfaction study, controls were also added for gender and size of the organization in which the alumni were employed in 2005.

Variables

Job satisfaction is the dependent variable, a categorical variable comprised of two levels coded as 1 (satisfied) and 0 (dissatisfied).

Dependent variables

Congruence captures the alumni perceptions with the question “To what extent is your current job related to your baccalaureate degree?” coded on a four-point scale (from 1 = “not at all related”, to 4 = “Totally related”). This congruence measure is similar to the one used by Wolniak and Pascarella (2005).

Waves of majors were grouped into three categories corresponding to Traditional (coded as 1), Scientific (coded as 2) and Novel (coded as 3). As previously noted, the traditional wave is made up of undergraduate majors introduced in the 1950s which include law, medicine, accountancy, administration, architecture and engineering. The second group of majors emerged in the 1960s–1970s and includes physics, chemistry, history and philosophy. The third wave of majors that took place in the 1990s–2000s includes international relationships, environmental engineering, computer sciences, and commerce. Traditional majors were used as the reference group in all logistic regression analyses (see Table 2).

Income is a single item based on a 7-point scale assessing monthly earnings in Mexican pesos ranging from less than \$2,000 pesos (US \$200) to more than \$20,000 pesos (US \$2,000). Economic sectors under consideration ranged from public sector (coded as 1) to education (coded as 9). Public sector was used as a reference in all analyses. Our review of the literature suggests that the public sector is associated with high levels of satisfaction (De Santis and Durst 1996; Karl and Sutton 1998).

Job autonomy and complexity was appraised by job position held by the alumni, ranging from undefined (coded as 1) to owner/partner (coded as 6). The order of these job positions reflects the presumed higher levels of job complexity, autonomy and task variety. We also assumed that professional jobs would provide the job holder with higher levels of autonomy and task variety in relation to those positions whose tasks are not defined. Such assumption is consistent with the literature (Dunham 1984). Building upon past research, this study added controls for size of company (ranging from micro to large), academic performance in college, gender and cohort. Consistent with BUAP’s graduation policies students exempted from completing a senior thesis because of their high academic standing

at the university were used as the high achieving reference group (students with GPAs of 8.5 or higher on a scale of 10, are exempted of submitting a senior thesis).

Analyses

Due to the dichotomous nature of the dependent variable, logistic regression was used to assess the relationship of personal characteristics, major and congruence with the probability of being job satisfied (Aldrich and Nelson 1986; Cabrera 1994; Hosmer and Lemeshow 2000). It is important to note that the probabilities reported in the result section should not be interpreted in terms of causal connections. We echo Wolniak and Pascarella's (2005) cautionary note as to the fact that causal connections for most of the variables examined are not tenable when the alumni survey collects predictor (e.g., job satisfaction) and criteria (e.g. income) measures in a simultaneous manner. Consequently, most of the relationships described in the results section should be interpreted as being predictive rather than causal (see Menard 1995).

The variables were grouped and entered in a sequential manner in order to discriminate more clearly for the contribution of majors in the probability of being job satisfied. As discussed by Cabrera (1994) and St. John and Starkey (1995) changes in the significance of the variables, resulting from adding new blocks, indicate the moderating role of such variables. The sequence followed in entering the variables was guided by the model postulated by Wolniak and Pascarella (2005).

Accordingly, the first block examines the degree of association between job satisfaction and background characteristics, cohort and academic performance in college. The second block incorporates employment and economic related variables such as economic sector, income and type of job. This block basically takes into account pecuniary (e.g., income) and non-pecuniary factors (e.g., type of job) associated with job satisfaction. The third block seeks to document the contribution of type of major on job satisfaction. Consistent with policy expectations, job satisfaction among alumni of novel and scientific majors was hypothesized to be higher than among graduates of traditional majors. The third block controls for the degree of perceived congruence between major and the job. Two goodness of fit measures are reported to appraise each logistic regression model. The χ^2 (chi-squared) signifies the extent to which the variables as a group are associated with job satisfaction, while the PCC reports the percentage of cases correctly classified by the model (Aldrich and Nelson 1986; Hosmer and Lemeshow 2000). To ease interpretation of the logistic regression estimates, delta- p^6 (Petersen 1985) statistics are reported for those associations found to be statistically significant. Basically, delta p reports the incremental change in the probability of being job satisfied relative to a predefined comparison group. For example, a delta- p of .116 for public employees indicates that alumni holding this type of job position are about 12% points more job satisfied than alumni holding undefined job positions.

Limitations

Measurement deficiencies and relying on a single institution limits the internal and external validity of our findings. Of the internal validity problems, measurement deficiency is the most important. As noted by Dunham (1984), job satisfaction is a multidimensional construct reflecting affective reactions to a variety of intrinsic and extrinsic work-related

⁶ The popularity of this incremental index well established in the higher education literature (e.g., Dowd and Coury 2006; Peng, So, Stage and St. John 2002; St. John and Starkey 1995; St. John et al. 2004).

factors. Our measure is a global one appraising satisfaction with the work in general. Such measurement restriction prevents us from making firm conclusions regarding the impact of our major typology on such intrinsic and extrinsic factors as pay, job stability, job itself, hours, schedule and working conditions. Mitigating against this measurement deficiency is the fact that our global measure is a reliable proxy of job itself. As shown by Vila and García-Mora (2005) our global measure of job satisfaction has a strong correlation with the job itself ($r = .66$). Since our job satisfaction measure mirrors an intrinsic factor it lends support to our using it for judging the importance of impact of major and congruence. As noted in our review of the literature, type of major and congruence seem to be linked stronger with intrinsic job related factors than they are with extrinsic ones (e.g., Smart et al. 1986; Vila and Garcia-Mora 2005; Wolniak and Pascarella 2005). In spite of this, future research in Mexico could profit from incorporating scales capturing intrinsic and extrinsic job related factors in their alumni surveys.

Another limitation of our study rests in the use of perceptions for assessing congruence. As noted by Spokane et al. (2000) the impact of congruence on job satisfaction can best be appraised when using both objective and subjective indicators for this construct. Unfortunately, our survey did not allow us to develop proxies for objective measures of congruence between type of major and type of occupation following Holland's (1997) six vocational and occupational typologies (e.g., Realistic, Investigative, Artistic, Enterprising, and Conventional). While college transcripts report all 47 majors BUAP alumni obtained, the alumni survey identified just 6 broad types of job positions. Future Mexican alumni research should include an extensive listing of occupations for survey respondents to choose from as is done in the CIRP alumni survey. However, recent research might call into question the need for such objective measures. Wolniak and Pascarella (2005) reported that their subjective and objective congruent measures were highly correlated to the point of potentially biasing their results. With a zero-order correlation of .65, it is possible to argue that these two measures are interchangeable as well. Aside from being a good proxy of objective congruence measures, the validity of self-reported congruence measures is well established in the literature. Using a congruence measure similar to the one used in our study, Vila and Garcia-Mora (2005) found self-perceived congruence to be one of the strongest predictors of 7 facets of job satisfaction. Kressel (1990) reported similar results while investigating correlates of job and degree satisfaction among social science graduates. Wolniak and Pascarella (2005) reported these findings as well when examining determinants of three facets of job satisfaction among college graduates from 30 Appalachian institutions.

Finally, our results cannot be used to judge the impact of federal and state policies across all Mexican institutions of postsecondary education. Our data are based on a single institution. The BUAP, however, is very influential in the Mexican higher education system given its size and prestige (Acosta 1999; Ornelas 2002). BUAP's practices in the 1990s of capping enrollment on traditional majors and offering new majors have been followed by most public universities across the country.

Results

Descriptive results

Table 1 displays variable definitions and descriptive statistics. This table also reports chi-squared statistics of association between being job satisfied and the different background,

Table 1 Variable definitions and descriptive statistics

Variables	Values	<i>n</i>	%	Association with job satisfaction	
				χ^2 , <i>df</i>	<i>r</i>
Job satisfaction	No	430	19.4	–	–
	Yes	1,790	80.6	–	–
Gender	Male	1,021	45.6	.17, 1	–.049
	Female	1,216	54.4		
Cohort	1997	695	31.1	2.47, 2	.049
	1998	883	39.5		
	1999	660	29.5		
Form of attaining bachelor's degree	Sr. Thesis	763	43.2	1.78, 1	.051
	GPA	1,002	56.8		
	Economic sector				
	Government	307	13.9		
	Agriculture	48	2.2		
	Industry	310	14.0		
	Commerce	319	14.4		
	Banking	86	3.9		
	Transportation	97	4.4		
	Health	354	16.0		
	Professional services	372	16.8		
	Education	321	14.5		
	Company size	Micro	600	27.0	10.71, 3**
Small		452	20.4		
Medium		323	14.6		
Large		844	38.0		
Other		100	4.5		
Job position	Teacher/faculty member	212	9.5	43.65, 5**	.130
	Public employee	105	4.7		
	Professional employee	1,223	54.9		
	Manager	395	17.7		
	Owner or partner	192	8.6		
	Other	100	4.5		
	Teacher/faculty member	212	9.5		
Monthly income	<2,000 Mexican pesos	68	3.1	124.50, 5**	.378
	2–3 thousand	196	8.9		
	3–5 thousand	703	31.8		
	5–7 thousand	618	27.9		
	7–10 thousand	421	19.0		
	>10,0000	206	9.3		

Table 1 continued

Variables	Values	<i>n</i>	%	Association with job satisfaction	
				χ^2 , df	<i>r</i>
Type of major by period of time it was created				12.57, 2**	-.110
	Traditional	942	42.1		
	Scientific	643	28.7		
	Novel	653	29.2		
Degree of congruency between major & current job				198.33, 3**	.451
	None	138	6.2		
	Low	150	6.8		
	Medium	567	25.5		
	Total	1,366	61.5		

* $P < .05$, ** $P < .01$

market, major and congruence measures under consideration. The last column reports the correlations between job satisfaction and the corresponding predictors. These correlations were estimated using the asymptotic distribution free procedures contained in PRELIS version 8.8 (Joreskog and Sorborm 2006). PRELIS is suited for estimating correlations among categorical and ordinal variables as is the case in this study (Finney and DiStefano 2006; Joreskog 2004).

The 1997, 1998 and 1999 entering freshman cohorts account for 31%, 40% and 30% of the sample, respectively. Females represent the majority of the college graduates and earned their degree based on high academic performance. Forty-two percent of the alumni attained degrees in traditional majors. The remaining portion of the sample was evenly distributed among scientific and novel majors. These figures are consistent with BUAP's institutional records.

As to their participation in the labor market, most graduates work as professional employees in private companies with less than 100 workers. The modal monthly salary ranges between 3,000 and 5,000 Mexican pesos. The majority of the alumni (61.5%) found employment that is totally congruent with their studies and are satisfied with their job (80.6%).

Job satisfaction, however, varies across major, income and market related variables. The highest correlates of job satisfaction are degree of congruence between major and current job ($r = .45$) and income ($r = .38$). Economic sector, company size and job position displayed the smallest correlations with job satisfaction. The chi-squared test analyses show no significant association between job satisfaction and gender, cohort and form of degree completion. Contrary to policy expectations, the degree of association between job satisfaction and type of major was negative. Graduates that report the lowest degree of job satisfaction are those who pursued scientific and novel majors, whereas alumni from traditional majors report higher levels of job satisfaction. Alumni who attained a traditional major degree show higher levels of job satisfaction than graduates of other majors, by 5–7% points.

Multivariate analyses

Although the profile emerging from the descriptive data contradicts policy expectations, descriptive statistics can be deceptive. They fail to control simultaneously for all the associations that exist with the dependent variable (Pedhazur 1997), in our case, job satisfaction. Table 2 reports the magnitude of the association between the predictors and job satisfaction in terms of logistic regression coefficient betas and delta-*ps*.

The first logistic regression model tests the hypothesis that job satisfaction could be explained mostly by personal characteristics, academic performance or cohort. The results do not confirm this hypothesis. These factors as a group do not have a significant relationship with satisfaction.

The second model adds economic factors as an alternative explanation to personal characteristics and college related factors. These factors correlate with satisfaction. When these factors are included, we also observe a cohort effect. Graduates from the 1999 cohort are 7% more satisfied than those from the 1997 cohort. It is important to point out that this difference remains even when we included other variables in subsequent models.

The third model makes up the central test of our study. Here we try to detect the net relationship between job satisfaction and type of major, while holding constant personal and economic factors. The model is statistically significant. The negative association of type of major with job satisfaction noted in the descriptive analysis is also found in the multivariate analyses. Graduates from novel majors are less satisfied with their jobs than are their peers from traditional majors, even after controlling for important variables as income, economic sector or job position.

According to the literature (e.g., Holland 1997; Smart et al. 1986; Elton and Smart 1988; Fricko and Beehr 1992; Wolniak and Pascarella 2005), congruence between major and job is an important conduit to job satisfaction. Adding congruence, then, might help clarify the association of different types of majors with job satisfaction. As shown in model 4, the relationship between majors and job satisfaction is mitigated when we incorporate congruence into the multivariate analyses. Model 4 also shows that this association is positive. In general, employees that report moderate congruence are 13% more satisfied than those who report no congruence. Those who report total congruence show a 17% net difference. This finding may suggest that the connection between majors and job satisfaction is indirect. Apparently, the importance of type of major on job satisfaction rests on the degree to which a BUAP's university degree equips the college graduate to meet job demands.

The model also reveals additional correlates of job satisfaction pertaining to the labor market, income and job characteristics. Satisfaction is higher among graduates who earn more than 3,000 Mexican pesos and who work in companies with over 100 employees. Satisfaction also varies across economic sectors: those working in the banking and commercial sectors are 20% and 13% less satisfied than those employed in the public sector.

In search of additional explanations

What could explain the fact that job satisfaction turns out to be lower among graduates from scientific and novel majors? After all, these alumni were expected to reap the social and economic benefits presumed to be associated with the new majors. Specifically, they should enjoy better working conditions and report a high degree of congruence between their undergraduate studies and their job than graduates of traditional majors. These factors combined should be associated with higher degrees of satisfaction as well. To answer this question, we further examined the degree of association between the three types of majors

and the significant predictors of job satisfaction. We also examined the association between unemployment and majors (see Table 3).

The income profile across major types, with some caveats, is strikingly similar. While graduates of novel majors seem to be placed at the higher end of the income distribution,

Table 2 Logistic regression results for determinants of job satisfaction

Variables		Adding demographics & controls		Marginal probability	Adding market & job related factors		Marginal probability
		Coeff.	S.E.		Coeff.	S.E.	
Gender	Women	-0.156	0.128		0.179	0.141	
Cohort	1998	-0.088	0.148		0.011	0.161	
	1999	0.185	0.165		0.448**	0.181	0.061
Type of degree completion	Academic performance	0.147	0.127		0.087	0.138	
Economic sector	Agriculture				-0.468	0.453	
	Industry				-0.065	0.328	
	Commerce				-0.896**	0.297	-0.177
	Banking				-1.233**	0.375	-0.258
	Transportation				-0.506	0.402	
	Health				0.128	0.299	
	Professional services				0.305	0.327	
Company size	Education				0.045	0.356	
	Small				0.199	0.216	
	Medium				0.023	0.231	
	Large				0.414*	0.209	0.057
Job position	Teacher/faculty				1.013**	0.428	0.114
	Public employee				1.041*	0.485	0.116
	Professional employee				0.652*	0.282	0.083
	Manager				0.857**	0.323	0.101
Monthly income	Owner/partner				1.439**	0.385	0.140
	2–3 thousand				0.495	0.337	
	3–5 thousand				0.640*	0.309	0.081
	5–7 thousand				1.426**	0.326	0.139
	7–10 thousand				2.200**	0.368	0.168
	>10,000				3.397**	0.601	0.186
Major by period of time	Scientific						
	Novel						
Congruency between major & job	Medium						
	High						
	Total						
Intercept		1.464**	0.145		-0.762	0.499	
χ^2 , df		6.32, 4			203.57**, 25		
PCC		81.40%			82.30%		

Table 2 continued

Variables		Adding type of major		Marginal probability	Adding level of congruency between major & job		Marginal probability
		Coeff.	S.E.		Coeff.	S.E.	
Gender	Women	0.182	0.142		0.264	0.149	
Cohort	1998	0.054	0.163		0.043	0.169	
	1999	0.501**	0.183	0.067	0.572**	0.191	0.074
Type of degree completion	Academic performance	0.086	0.139		0.055	0.145	
Economic sector	Agriculture	-0.492	0.455		-0.683	0.475	
	Industry	-0.100	0.329		-0.250	0.342	
	Commerce	-0.871**	0.298	-0.171	-0.672*	0.315	-0.126
	Banking	-1.212**	0.376	-0.253	-0.987*	0.395	-0.198
	Transportation	-0.413	0.405		-0.608	0.422	
	Health	-0.041	0.310		-0.402	0.324	
	Professional services	0.222	0.329		-0.131	0.343	
Company size	Education	0.080	0.358		-0.060	0.374	
	Small	0.222	0.217		0.189	0.225	
	Medium	0.072	0.233		0.146	0.244	
Job position	Large	0.441*	0.210	0.060	0.527*	0.219	0.070
	Teacher/faculty	1.021*	0.428	0.114	0.334	0.465	
Job position	Public employee	0.904	0.489		0.377	0.525	
	Professional employee	0.616*	0.283	0.079	0.038	0.321	
	Manager	0.868**	0.324	0.102	0.294	0.360	
	Owner/partner	1.417**	0.386	0.139	1.035**	0.421	0.115
Monthly income	2-3 thousand	0.528	0.338		0.550	0.358	
	3-5 thousand	0.663*	0.309	0.084	0.731*	0.329	0.090
	5-7 thousand	1.451**	0.327	0.141	1.448**	0.346	0.140
	7-10 thousand	2.207**	0.369	0.168	2.246**	0.388	0.169
	>10,0000	3.411**	0.601	0.186	3.410**	0.615	0.186
Major by period of time	Scientific	-0.292	0.191		-0.087	0.198	
	Novel	-0.397*	0.186	-0.070	-0.212	0.194	
Congruency between major & job	Medium				0.616	0.332	
	High				1.291**	0.281	0.132
	Total				2.294**	0.279	0.170
Intercept		-0.585	0.506		-1.834**	0.571	
χ^2 , df		208.4**	27		309.63**	30	
PCC		82.50%			82.8*%		

Reference groups are males, members of the 1996 cohort, who graduated from college with a thesis, working for the government, holding undefined job positions, earning less than two thousand pesos per month, with traditional majors and holding jobs that bear no connection with college major

* $P < .05$, ** $P < .01$

Table 3 Percentage distribution of alumni across significant predictors of job satisfaction

Variables	Major by period of time			Overall degree of association with the predictor	
	Traditional	Scientific	Novel	χ^2 , df	<i>r</i>
Job satisfaction	84.0	79.4	77.0	12.57, 2**	-.110
Income				31.37, 10**	.071
3–5 thousand Mexican pesos	29.7	35.8	30.9		
5–7 thousand	26.3	26.7	31.4		
7–10 thousand	20.9	15.7	19.7		
10 thousand or more	8.5	9.8	10.0		
Economic sector				623.92, 16**	-.061
Commerce	7.9	16.7	21.5		
Banking	2.7	3.5	6.0		
Government	14.5	11.8	15.0		
Company size				122.31, 6**	.215
Large	33.4	41.2	41.6		
Job position				298.98, 10**	-.050
Owners or partners of companies	12.5	4.2	6.9		
Congruence between major and job				162.65, 6**	-.379
Medium	15.5	33.0	32.7		
Total	76.8	50.8	49.8		
Unemployment rate	7.0	13.5	10.2		

* $P < .05$, ** $P < .01$

the differences in percentages are rather small, about one percentage point. Moreover, graduates of scientific and novel majors tend to be placed at the lower end of the income distribution in proportions slightly higher than graduates of traditional majors.

The economic sector is another important factor distinguishing among majors. On the whole, graduates from novel and scientific majors are more likely to work in commerce and banking, two sectors that report the lowest level of satisfaction. The fact that nearly 17% of graduates from the sciences and humanities end up working in commerce should once again call our attention as to the lack of alignment between major and work. In turn, alumni from traditional majors are more likely to own or be a partner of a company, a position which grants independence and generates higher levels of satisfaction.

Congruence between major and job is the factor that distinguishes alumni the most. Only half of the graduates from novel and scientific majors report total congruence between college major and the job. In contrast, the vast majority (75%) of alumni of traditional majors report total congruence between their undergraduate studies and job demands. One conclusion drawn from this data is that graduates of novel and scientific majors apparently have acquired skills and competencies that may not entirely be aligned with the needs of the labor market.

Unemployment⁷ is also a factor that sets apart majors. Unemployment levels are the lowest among those who pursued traditional majors (7%), and the highest among those

⁷ Twenty-five percent of the alumni were excluded from the computation of unemployment rates. Either they were not seeking for jobs, or were pursuing postgraduate studies at the moment the interview took place.

who secured scientific and humanistic majors (14%). Those who pursued novel majors are in the middle, with an overall unemployment rate of 10%. The higher than anticipated unemployment rate among graduates from majors created in the 1960s–1970s is particularly troublesome. In theory, they should face little competition from graduates from other universities. After all, the BUAP accounts for 90% of the enrollment in natural and exact sciences, and for 80% of those pursuing a degree in humanities in the state of Puebla (ANUIES 2003a, b; BUAP 2004).

Conclusions

For almost two decades, public policy has favored those majors believed to prepare a labor force suited to the needs of a new economy. Such policies resulted in capping enrollments of traditional majors, while favoring new majors. Antithetical to commonly held beliefs, the traditional majors do not show high unemployment or low satisfaction. On the contrary: the lowest levels of job satisfaction and the highest rates of unemployment are found among the graduates of non-traditional majors.

Several potential reasons come to mind to explain why enrollment policies did not work. One plausible explanation may rest on the validity of the assumptions about the new economy. Perhaps the new sectors that were to accompany the looming knowledge society never materialized. National and regional labor markets remained dominated by organizations that never adopted the new technologies at the same pace as American and European organizations. If so, the graduates of novel majors were prepared for a labor market that is incipient at best.

Another scenario is that the supply of new majors may have outpaced its demand. Saturation indeed may have taken place among the graduates of novel programs compelling them to take on job positions bearing little resemblance with their college qualifications.

A third explanation could relate to the content of the new majors themselves. Majors like urban design, urban development, industrial engineering and international relations might be considered by employers to be overspecializations of architecture, engineering and law, respectively. Narrowly prepared, their graduates would have to compete with graduates of traditional majors who may be more flexible to adapt to new job requirements. Graduates of traditional majors may enjoy more possibilities to create their own company (usually an office or practice) or to become an associate of one. Additionally, their preparation may enable them to hold positions in the public sector with more job stability. They may also profit from holding degrees that are easily recognized by employers.

Partial support for these scenarios can be found in studies on the condition of labor markets in Mexico and Latin America. In regards to the adoption of new technologies, the World Bank recently reported that Latin American economies have lagged behind other emerging economies in technological achievement during the years of 1998–2007. For instance, Mexico, like the rest of its Latin American counterparts, was found to have installed less broadband equipment and having fewer subscribers of Internet services than poorer East Asian countries (Economist 2008). The World Bank also noted that Latin American universities rather than private companies led in absorbing technological developments and spending in research and development. Low levels of technological absorption by companies also seem to correlate with a low demand for highly trained workers. In 2002, the Economic Commission for Latin America and the Caribbean (ECLAC) reported that the Mexican economy had difficulties absorbing an increasing

supply of qualified professional workers into the labor force. Many college graduates were found to be employed in lower-paying positions in the service sector. Additionally, support for the lack of congruence between college preparation and job demands is provided by Katz (2000). While examining job descriptions in different economic sectors, Katz reported a decline in the levels of knowledge and skills needed to perform many jobs in the industrial sector, particularly those in the areas of engineering and computing innovation.

Our study has important implications extending to enrollment policies, college enrollment management and research. From a policy perspective, this study exposes the danger of enacting college enrollment policies that are not aligned with the realities of national and regional labor markets (ECLAC 2001). Contrary to expectations, public policy for almost two decades has favored majors associated with higher than anticipated job dissatisfaction and unemployment rates. This policy has also favored majors that are incongruent with labor market demands. Our examination of changes in enrollment distribution also underscores the little influence federal and state governmental actions and policies have on individuals' choice of college majors. Enrollment caps, rather than shifting the distribution of students from traditional to novel majors, altered the distribution of public-private enrollment. Students voted with their feet enrolling at private universities eager to offer the kind of college majors public universities shied away from (ANUIES 2003a, b).

From a college enrollment perspective, the importance of major-job congruence connection indicates that universities can and should play a crucial role in the link between higher education and the labor market. Their effort may concentrate on the major itself by making certain it fulfills vocational interests and abilities functionally aligned to occupations (e.g., Holland 1997; Pascarella and Terenzini 2005; Elton and Smart 1988; Wolniak and Pascarella 2005). The literature seems to follow two approaches for making certain this linkage takes place. One approach seeks to single out those competencies deemed critical by educational leaders and employers (Jones 1996). The other approach adopts content validation strategies targeted to jobholders. The basic tenant is to define the relevant knowledge, values and abilities that enable a college graduate to succeed in the job under a variety of conditions (Roberson et al. 2002).

It is also important to note that the correlates of job satisfaction among Mexican college graduates are remarkably consistent with the literature. Income, economic sector, type of job, job position and congruence between college major and the job are as valid correlates of job satisfaction among European (e.g., Vila et al. 2007) and American college graduates (e.g., Wolniak and Pascarella 2005) as they are among Mexican college graduates. This finding argues on behalf of conducting international studies that would provide a better context for understanding how these factors operate for different majors across different countries. Finally, future Latin American alumni studies could profit from some of the lessons learned in this study. Those include the need to incorporate multi-facet measures of job satisfaction similar to those developed by Hackman and Oldham's (1980). Of course, they should be modified or even revamped to better reflect the conditions and characteristics of these societies. Equally important is to work with multiple objective indicators of congruence. Some objective measures could be developed by having an inventory of different occupations. Others could be collected via standardized instruments while the individual is still in college. Having a variety of congruence measures collected over time could greatly help Latin American universities enhance their knowledge as to how vocational choices in Latin American countries operate in the labor force. Certainly this information could assist their college counselors in orienting college students as to the occupational opportunities open to different majors, while paying attention to their

vocational inclinations and abilities (Spokane et al. 2000; Wolniak and Pascarella 2005). Altogether, these measures would greatly help universities to move from hunch-based policies to a better knowledge of the actual demands in the labor market.

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