

Institutional Paradigm and Learning in Higher Education in Models with Labor-Leisure and Game Theory

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Learning in higher education, which depends on effort, commitment and motivation on the part of the students may be influenced by institutional models defining the relationship between students and professors. Many college models define the relationship as purely business-like where students are regarded as customers. Other models suggest students are clients or patients. Yet, some institutional cultures recognize students as medieval apprentices. Three learning outcomes arising from different institutional models are described. Using labor-leisure model and game theory, this paper shows that students would put less effort and commitment in an educational environment where they are treated as rational consumers than they would in other models.

INTRODUCTION

The acquisition of education by an individual has always been considered to be the creation of human capital. The pursuit of higher education is of value in many societies because it is seen as development of human potential, capability enlargement and the accumulation of life-oriented skills (Lanzi 2007). The social benefits arising from acquisition of higher education could be regarded as priceless as most people with a good higher education are social assets because such individuals are better husbands and wives, better neighbors and more resourceful in any endeavors.

Effectively, human capital resulting from the attainment of higher education is responsible for a better quality of life (Winters 2011). Many nations consider it a public good that should be encouraged through government subsidies.

The notion that higher education results in the accumulation of human capital is correlated with the perception of a learning model that compares the professor-student relationship to that of master-apprentice or doctor-patient. In a master-apprentice scenario (Morgan, et al. 2010), the obligation of each participant is well defined; the apprentice is prepared and willing to absorb the material while looking to the master to provide the training. The apprentice receives on-the-job training, thus is a worker (George 2007) and participates in the learning process.

The master-apprentice notion of the professor-student relationship is similar to the doctor-patient relationship. Pettit (2008, p. 248) integrates the relationship in this way. "Above all, effective doctors and teachers listen to people they serve. Similarly, effective patients and students are attentive, prepared, responsible, resourceful, assertive, and accountable for their actions. Moreover, effective patients and students are skilled note takers." Effective students participate in their learning just as healthy patients participate in their health stock. Although the medieval master-apprentice relationship represents vocational oriented learning, in this paper it is used to convey rigorous and intensive learning.

Owing to stiff competition among higher education providers for the past 40 years, master-apprentice and doctor-patient learning models are eroding. Students are continually recasting themselves as customers (George 2007; Onsmann 2008) and the student customer is “always right” (Scott 1999 & Pitman 2000). Scott refers to the model that regards students as customers as “marketization” of higher education: students have the market power because they pay the tuition.

In the customer academic institutional paradigm the professor-student is akin to frontline manager-customer or patron-client relationship. A customer is similar to a client. Generally, a customer can be considered as a patron¹ and the latter is defined as a client of an establishment (Cooper & Schindler 2008). For instance, lawyers provide legal advice to their clients. In a political institutional hierarchy, patrons expect loyalty from their clients in exchange for favor or protection (Morgan et al. 2010). Under this context, professors are to protect student interests if students meet their obligations. Although the relationship is un-coded in any documents containing the goals and objectives of institutions of higher learning, it defines the nature of the product delivered to the student.

THE NATURE OF THE PRODUCT: EDUCATION

Unlike other products and services in human needs (be it medicine, food, clothing, housing, transport, and exercise machines) the student does not know (Sharrock 2000), either before or after receiving the services, whether s(he) got what s(he) paid for. Education is a service that needs greater participation from the students (Pettit 2008; George 2007). The professor presents the materials and it is the student’s responsibility to absorb and assimilate the materials through rigorous personal efforts, commitment and further synthesis and rationalization especially at the graduate level. It requires greater desire and interest beyond immediate economic gratification on the part of the student to make such a sacrifice.

Educational sacrifice entails personal and impersonal costs that yield both non-salable and salable benefits (George 2007). Students, in an attempt to maximize their utility in conformity with economic theory, minimize personal sacrifice by putting in less effort and time for learning, because they are only under obligation to incur the impersonal costs (tuitions and fees). Also, using labor-leisure model, the personal and impersonal costs are substitutes because, knowing the priorities of modern students, the more time and efforts put into learning, the less time available to work and pay for tuition and other composite market goods.

Thus the nature of education emanating from different educational paradigms can be classified into three categories: ideal, practicable and dysfunctional education. “Ideal” education offers limitless levels of instruction to the students and students are under university obligation to acquire and master skills relevant to their disciplines. The information and knowledge acquired during college years under “ideal” educational environment are limitless because ambitious and curious students supplement classroom and textbook materials with their personal insights and effort. Graduates of an ideal education, owing to acquired skills and knowledge, enter the workplace to reengineer already existing processes in their field and rediscover new and more efficient processes and in many cases, become an entrepreneurs by introducing new products.

Their objective of expending time and energy in the acquisition of knowledge is not for the sole purpose of the immediate salable economic rewards: to “get a job,” (Falkinger & Zweimuller 2000; Vergaest & Omeij 2006; Riddell & Xueda 2011) but for the personal satisfaction and deep interest to make contributions to their fields. This category of learners is capable of moving society forward owing to their creativity and innovation. This is the human capital notion of education.

However, in response to commercialization of all activities in modern market economies (Scott 1999), the goal of attending a college has been reduced to just “get a job,” and the highest barometer of a good college program is the number of “products,” i.e., students, employed. “Practicable” learning for the purpose of starting a career provides knowledge and information that is useful but known by the employer, and the educational standard expects the student, with only minimal training, to understand prevailing processes in the industries.

Ideal education, except for vocational subjects, theorizes optimality, efficiency and the best outcomes. These outcomes are abstracts and, with available technology are impracticable in the industries at a point in time. Therefore, learning designed for the purpose of performing a function in the industries could be considered substandard.

Students' approach to learning under practicable education is to acquire just enough skills to be employed, and they would try as much as possible to minimize the personal cost (effort and commitment) of acquiring education (George 2007) by using study time for other activities. Students seeking this type of education tend to filter what they learn in college as they discard abstract and complex analyses they believe are unnecessary in the work place. Since the ultimate goal of higher education under this model is starting a career, some colleges award one to two years of college credits for work experience (George 2007). This practice satisfies the corporate sector as corporations consider themselves to be the pace-setters for educational institutions and not the other way around.

The last category of product resulting from the higher educational model, which is referred to here as "dysfunctional," is neither ideal nor practicable. Dysfunctional education serves the needs of those who may have the desire to attain ideal education but lack the background and resources to invest in such rigorous learning. Some profit-making institutions exist to take advantage of this category of students and they are quick to accept these students as customers. The students can "have it their way" and consumer satisfaction is guaranteed (Delmonico 2000; George 2007). The administrators of these institutions believe they can compensate for the poor background, lack of time and effort on the part of these students by passing the student's responsibility on to the faculty. This responsibility shift is supposedly accomplished by sending the instructional staff, in addition to their credentials (M.A. or Ph.D.), to weeks of rigorous orientation².

This learning model can be considered dysfunctional for several reasons. Education is co-produced and knowledge and skills acquired cannot be packaged and exchanged (Sharrock 2000). Students do not know what they are buying; the professor understands the learning environment, and the students cannot tell even after graduation if they got what they paid for. Thus, there is a principal-agent problem.

This new customer-oriented brand of educational model is successful because it is compatible with modern technology that enables students to find answers to any question by the click of a mouse. The student-consumer model saves time and efforts. Modern students, whom Barnes et al (2010) and Hay (2000) refer to as Net Geners (the internet generation) want quick rewards and have no sustainable concentration for rigorous activities and long educational programs.

Whether students attain similar level of knowledge and skills in the manager-customer model of learning as do their counterparts in master-apprentice or doctor-patient models is a matter of empirical investigation. The rest of this paper will, however, use the labor-leisure model and game theory to allocate the burden of learning in master-apprentice and doctor-patient educational paradigms on one hand versus patron-client and manager-customer business models on the other hand.

A LABOR-LEISURE MODEL

We assume that students have in their preference bundle, consumption goods (labor) and leisure time (comprised of study time and other non-market activities such as time on social media, u-tube, texting, chatting with friends online, partying, etc.). Students as rational consumers maximize their utility as a function of consumption goods and leisure hours, $U(C, l)$, subject to their total income,

$$wT = pC + wl \tag{1a}$$

where w = wage rate, $T = 24$ hours and p = price of composite goods. Thus, $pC = w(T-l)$ and the size of the composite goods can be expressed as

$$C = (24-l)w/p \tag{1b}$$

Equation (1a) states that the amount of consumption goods the students can daily afford equal 24 hours less leisure time (l) multiplied by the ratio of her wage and the price of the composite goods. Consumption goods available for students perceived as apprentice is lowered by the study time, k . Thus, Eq. 1(b) becomes

$$C = (24-l-k)w/p \quad (2)$$

The Lagrange equation for students as customers is

$$L = U(C, l) = \lambda[w(T-l) - pC] \quad (3)$$

Where λ is the Lagrange multiplier. The Lagrange equation for students as apprentices is

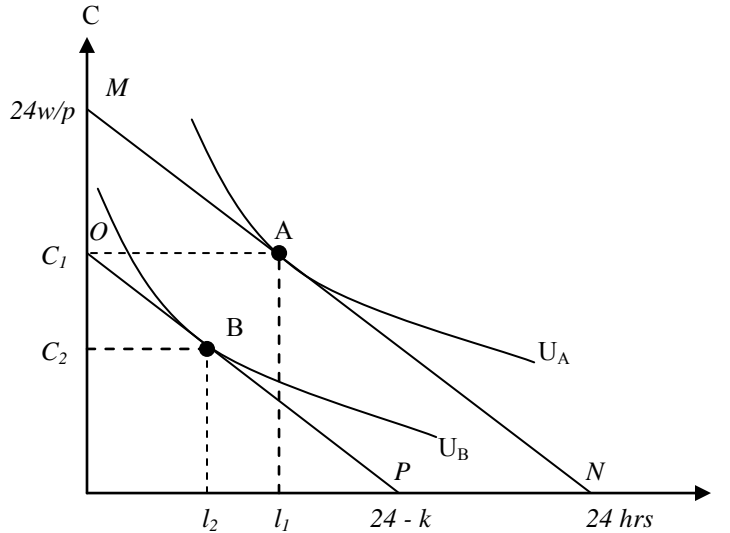
$$L = U(C, l) = \lambda[w(T-l-k) - pC] \quad (4)$$

From equation (3) and (4), we obtain the student's normal marginal rate of substitution between consumer goods and leisure as

$$MRS_{cl} = w/p \quad (5)$$

On figure 1 below, the amount of time available for leisure hours and consumption goods is reduced for students regarded as apprentices than students considered as customers.

**FIGURE 1
LABOR-LEISURE MODEL**



C = consumption goods; p = price of consumption goods; l = leisure
 k = study time; $T = 24$ hours; and $L = 24-l$ = labor hours.

Students' utility at point "A" (C_1, l_1) figure 1 is higher than at point B because students perceived as customers do not consider education as investment in or development of human capital that would increase potential earnings. At point "A" the students have higher consumption ability and leisure time. Study time is leisure and a non-market good. Given that study time reduces the time available for work

and other leisure activities, students would, given their consumer power, minimize it as much as possible. In a college environment where the student is considered a customer, and the “customer is always right,” the professor cannot help but respect the choice of the students between labor and leisure/study time.

In a master-apprentice or doctor-patient model, the professor and the students know their roles and the professor has the authority to present rigorous lectures that are commensurate with college student standards, and evaluate the level of understanding through reasonable assignments and examinations. The professor under these models does so under the professional ethics of teaching.

The general rule of thumb is that a student is required to study 2 hours for every one hour of credit hours enrolled (George, 2007). A full-time student who is registered for a minimum of 12-15 credit hours would be required to commit equivalent of study time per week. Through assignments and examination preparations, the professor could reduce the daily leisure time available to the student to l_2 (point B) in figure 1.

The budget line moves from MN to OP. k impact on the budget is similar to a proportional income tax. It is the mandatory additional study time required under the master-apprentice paradigm. Thus, it is up to the student to reallocate the remaining time between labor and other leisure activities, l_2 . Thus, at l_2 and C_2 , under master-apprentice and doctor-patient paradigms, the student uses more study time and less consumption goods (labor hours), respectively, than manager-consumer and patron-client models. Otherwise the student receives poor grades and becomes a potential college drop-out.

QUALITY CONTROL AND NASH EQUILIBRIUM

The college administrators who unintentionally or deliberately create the college models would from time to time determine the quality of courses offered by taking customer surveys through students’ evaluations. Student evaluations are not peculiar only to manager-customer model of learning. It is a means for the professor to improve on the quality of the course and also for administrators to determine if the student customer is happy.

Under different models of higher education, we can determine the quality of the course and the student’s level of learning from a course using simple game theory. The players of this game are the student and the professor. The professor wants to save his/her reputation or at best earn that promotion, while the student maximizes his/her utility as illustrated above by the amount of labor-leisure time at their disposal. The strategy facing the professor is whether or not to be rigorous in course material. The students are faced with two choices: learn by putting in more time or save their time and efforts by not learning.

Teaching and learning is a multi-period game. Under the manager-customer model of education, the burden of learning is on the professor because the student customer is “always right” (Scot 1999 & Pitman 2000). At the end of the first period, the student-customer takes a quality survey (student evaluation) about the quality of the course. In this game both the professor and the student maximize their utility, are aware of the other’s situation and choose the strategy taking into account the institutional model.

TABLE 1
MANAGER-CUSTOMER RELATIONSHIP

PLAYERS		STUDENT	
	STRATEGY	More effort	Less Effort
PROFESSOR	Rigorous	More effort Rigorous	Less Effort Rigorous
	Less Rigorous	More effort Less Rigorous	Less Effort* Less Rigorous*

Based on Fig. 1, the student has high preferences for labor time; he is aware of the institutional environment, and has less value for study time and chooses “less effort.” The professor is also aware of the educational model in a particular institution, bearing in mind that if the student is not happy, it reflects on the evaluation, which would be used against him/her in the next periods, and therefore chooses “less rigorous” materials for the class just to please the students-customers. Although students are regarded as rational consumers, they do not really know what is supposed to be learned from the course (Sharrock, 2000), and therefore cannot determine if they are being short-changed. Students earn high grades and the professor receives good student evaluations.

The professor is worse-off if s(he) is rigorous but the students put in less effort and the former inflates the grades (George 2007). Students’ evaluation would reveal students’ vengeance on the professor at the end of the semester. The Nash equilibrium from the four cells on Table 1 would be “less effort” and “less rigorous” as indicated by the asterisk. This is also the case by tacit agreement between the two players.

The multiple period games are relevant for adjunct professors who would like to renew their appointment in the second period. It is less of a factor for tenured professors. Therefore, it is not a coincidence that many manager-customer-oriented higher institutions prefer adjunct instructors. This is not only to save cost but is psychologically compatible with the manager-customer learning model.

TABLE 2
MASTER-APPRENTICE RELATIONSHIP

PLAYERS		STUDENT	
PROFESSOR	STRATEGY	More effort	Less Effort
	Rigorous	More effort*	Less Effort
	Less Rigorous	More effort	Less Effort

In a master-apprentice scenario (Morgan, et al), the obligation of each player is well defined and the administration creates an environment that would induce students to learn. Although student evaluations are very important here, education is co-produced and cannot be packaged and exchanged. The burden of learning is on the student: put more efforts and learn the materials presented by the dedicated professor or drop out. In this learning paradigm, the Nash equilibrium would be “more effort” and “rigorous” on the part of the student and professor, respectively.

Under this educational environment, multi-period strategy and being an adjunct are irrelevant. The master-apprentice model is within the “ideal” educational category, because the goal of this type of education is for the student/apprentice to master the material, and if this occurs, it is presumed that “getting a job” would be automatic.

CONCLUSION

Different professor-student relationships (doctor-patient, master-apprentice, patron-client and manager-customer) are described. These relationships produce different learning results in higher education. The products could be the “ideal” graduate whom everyone expects to be human capital through productivity, creativity and innovation. Societies producing these graduates would be progressive. Other graduates received a “practicable” education designed only to “get a job” to satisfy the corporate sector; or a higher educational product whose goal is just to obtain “dysfunction” degrees regardless of learning.

In modern technologically saturated economies, in addition to the necessity for the student to work and make a living, students have so much to do with their time. Students would prefer to earn a degree without putting in as much effort and commitment as required. Learning and labor hours are substitutes.

It is shown that under manager-customer paradigm, using a labor-leisure and a simple game model, the Nash equilibrium would be “less effort” and “less rigorous” in learning and teaching, respectively on the part of students and professors. Under the master-apprentice and doctor-patient institutional paradigms describing the students-professor relationship, on the other hand, the Nash equilibrium is “more effort” in learning and “more rigorous” in teaching from the students and faculty, respectively. Thus, the institutional environments where students and professors find themselves dictates the level of learning in higher education.

ENDNOTES

1. A department of the institution of higher education, the library, already established itself as serving the needs of patrons. Every university library recognizes students as patrons.
2. Some instructors who attended this faculty orientation have frequently referred to it as a “boot camp.”

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