



Review Article

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Student Riches

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Introduction

When students are at an institution to have a college degree, they don't always they visualize the important time in it, since at the end of it will change their lives, the way of seeing, handling and solving many problems. It is necessary to value all opportunities to realization that we can find in the educational institution. With the goal of advising in time, I condense in this writing the most important ones successfully applied throughout my professional life and identified as the "student riches" acquired at the TEC de Juárez.

"Student wealth" is the accumulation of knowledge, experiences, creating that invaluable human potential of learning something new every day to one day contribute something more with the goal of changing the world to make it more accessible to all.

In 1977 I was working in a maquiladora plant in Ciudad Juárez, known as "RCA Components," where we assembled color televisions. My work at the plant was an electrical test engineer, where my responsibility was the test stations for different electronic modules of the televisions that were assembled there under a level of Very strict quality [1]. That year a colleague in the maquiladora told me that he gave a class at the "Instituto Tecnológico De Ciudad Juárez (ITCJ)", today known as "TECNM-Cd. Juárez." That day he asked me to teach his class since he was sick. I gladly accepted, personally I had experience as an instructor, since when I was an engineering student, He also taught courses in the laboratories of the Technological Institute of Studies. Superiors of Monterrey (ITESM) in Monterrey. After introducing myself to those in charge of authorizing those courses at the ITCJ, I proceeded to go to the room assigned to teach the class and I found pleasant surprises, students very enthusiastic to learn, I saw myself reflected in them in me student time. In 1978 I decided to apply at the ITCJ to teach as a "teacher subject". After interviews, courses, and tests on effective teaching techniques for teachers, I was finally accepted. That's where my life change began, focused on helping to develop "student wealth", based on mutual collaboration by being a teacher of young

people enthusiastic about learning, where many of them worked in maquiladora companies in the afternoon shift as technicians and/or operators, and in the afternoons, they studied to become engineers and improve their economic standard of living with their professional studies. With them, my professional engineering career changed from a practical way as a test engineer at RCA Components to teaching.

Effective Learning

At first, I was hired as a "subject teacher"; that is, every semester I am they assigned different subjects, and these were very varied: courses in Physics, Mathematics and especially Electrical and Electronics, where he taught theoretical and practical classes in the laboratories of digital and analog electronics, electrical engineering laboratory and others. In each of the classes I taught, we allocated the last 15 minutes and dedicated them to analyzing the current problems of the community where this subject could be applied and how we could integrate them with the new technologies available. These were the most interesting of the classes and laboratories, since almost everyone participated with ideas, and those who soon or later also joined "brainstorming" proposed solutions to help our community.

In addition, in the "teachers' room" we met during recesses with many very enthusiastic professors, where they talked about many of their experiences, which were very varied, from engineering, economics, law, production, and many more. There I managed to grow a lifelong friendship with them. After a year I was given "full time", and of course I accepted. At that time, I saw it as a great opportunity, since in addition to teaching, it would also serve to continue preparing myself, reviewing all the subjects and updating myself on topics of great interest, to be ready to study and continue studying the Master's and Doctorate in US universities, since my goal was to be a "professor-researcher".



Student Wealth #1: "Effective Learning"

Those who learn the most in classes are people with a positive attitude; This is detectable in the teachers and students who participate in their activities. When preparing the classes, the teachers review what they have learned, cover all the material from various angles of study to be ready for questions from the group, and they are also obliged to be up to date on innovations technological activities, as well as restless students who actively participate in class, who ask more, and especially who ask questions at the end of the class, showing their interest in.

The Balance Between Academic, Social, Cultural and Sports Knowledge

I really enjoyed teaching at ITCJ by being in touch with that special human potential that each student has, and helping them to discover, polish and develop their talents and academic skills, but in reality, it is also necessary to cover social, cultural and sports skills. At the ITCJ I witnessed a natural way of intertwining these activities in a very effective way. On certain days between breaks between classes in the institute, ceremonies were presented in the courtyard or on the esplanade. We enjoyed these events very much all the present, students, professors, administrative staff and administration workers. These extracurricular activities were the participation of "war band", "musical events" including "estudiantina", "folkloric dances", "choir" and others, "literature events" such as "poetry", "theater" and even news with advances of various social and sports events such as "swimming", chess, ball games such as "volleyball", "basketball", "soccer", "baseball", "softball" and others. Where the participants were students with those skills and talents in an admirable and fun in those moments of rest, which transported us to a state of total relaxation between classes.

a. The "War Band" was very common to see them with that military activity that strengthened all civic values, and in turn strengthened ethical values. The "war band" used them to work as a team, sowing that security and confidence in themselves with love for our homeland. In addition, they participated in multiple very significant events such as school parades, ceremonies honoring the flag and civic events. I especially remember 2 young students who were my students: a student who always went in front of the band who played the natural cornet, a brass instrument identified as a "military band cornet", and a student who played the drum at all costs. A very great friendship grew with them, they married and had children, whom I also had the joy of giving special computer classes and also guiding them in their professional vocations.

b. "Musical events" that he enjoyed the most were the "Estudiantinas". We saw them between classes in the courtyard of the ITCJ as very special musical groups with their cheerful, bold, romantic and fun songs. With those black suits, black capes full of ribbons, knee-length pants and carrying a coat of arms. Playing various musical instruments, such as guitars, double bass, mandolins, lutes, bandurrias, accordion, violins, tambourines, percussion and other musical instruments. Singing melodies of various kinds; romance, folklore and a wide variety of other traditional songs. These

activities, apart from relaxing us all in the wonderful things that are achieved by working in a group, perfected their musical talents, and at the same time amazed all the attendees, giving those smiles of joy and satisfaction, helping a lot in our mental renewal in the next class with a lot of optimism [2].

c. "Folkloric dances" where we enjoyed dances of all kinds that transported us traveling to many places in Mexico, among them: the "dance of the old men" where they honored everyone, especially teachers in middle age, "jarabe tapatío" and much more. These celebrations had a great variety of "dances" Mexican folkloric dances" with regional dances according to ethnicity and geography, with that rhythmic elegance of movements. Wearing colorful costumes and special ornaments, expressing all the feelings in the interpretations.

And many more events, I will tell you a personal experience; two students from one of my classes always brought his guitar, and one day at the end of the class I asked him to perform a duet song, with great pleasure and pride they did. In addition, at that time I had a very special girlfriend and I asked them for the service of "Serenata", where they performed romantic songs. At the end of the serenade, they sang a special song that they themselves had written. It was titled "spring song" and this helped to ask her to get married to start our family.

Student Wealth #2: The Balance Between Academic, Social, Cultural and Sports Knowledge

The student period should not only be limited to the balanced acquisition of academic knowledge, it should include the development of social and sports skills. Finding a healthy balance is very important between striving to study to learn more knowledge, without neglecting the emotional and social well-being that allows activities recreational that help relax the mind that improve academic performance. The best way to achieve this is to develop self-discipline, learn to prioritize and make effective decisions based on critical thinking to avoid burnout.

Continuous Update

One of the great challenges necessary for students, professionals and especially teachers is to keep up with the latest trends and evolutions Technological. "People who disconnect from advances begin to be displaced by others with more vision." In my courses I detected the need to integrate new topics updated in each of the respective subjects. After 2 years I managed to obtain a scholarship to study in US Universities, so in 1980 I reached my goal of continuing to study through an intergovernmental educational program between the USA and Mexico. I was sent to study for 6 months in Philadelphia, Pennsylvania, at the prestigious university "Temple University". There I studied advanced English to pass a required exam in the universities of the United States known as TOFEL. In addition, I was allowed to study one of my passions, "Applied Mathematics" with excellent teachers with whom I We made an enduring friendship. With them we also had the opportunity to get to know the city and the excellent museums of Philadelphia, including science, history, art and many more. At the end of the 6-month preparation,

I was surprised that I was accepted at the prestigious “University of Massachusetts” to study the “Master’s Degree in Electrical and Computer Engineering”, where I specialized in simulation of computational processes, computer networks, and applied mathematics. When I finished, the University offered me to continue with my doctoral studies with a scholarship granted by a company with its corporate in Massachusetts called “Digital Corporation”, creators of the first successful minicomputers known as “PDP-11” and “Mainframe type computer commercially known as VAX” [3]. Unfortunately, he cannot accept it because he had signed upon receiving the Master’s scholarship to return to Mexico and teach at the ITCJ for at least the same duration of the time I was on scholarship.

Student Wealth #3: “Continuous Updating”

By preparing more and updating, a potential for new theoretical knowledge is generated, added with experiences that promote more efficient ideas and that generate an immense concern to apply it and to transmit what has been learned to others, to sow in them the importance and benefits of continuing to prepare continuously throughout their profession for the benefit of the community.

Share Acquired Knowledge

When I finished my master’s degree, I returned to Ciudad Juárez and rejoined ITCJ, where I continued to teach courses, especially in the area of electronics and computing. When he was in contact with the students again and when he detected how eager they were to learn new technologies that he had learned in the master’s degree, the project of “designing and building a personal computer” was born in the institution to be used by the students themselves.

In at that time, minicomputers and mainframe computers were used. There were not yet affordable personal computers on the market, those from IBM, Apple and other brands. With the help of

students, we began to idealize a project to build a personal computer for students of the technological school, with advice from other professors, and the work of students from the last semesters. We complete the design of this using simulations of its processes, and then physically build it with “prototype technology”. Our personal computer was divided into 5 circuit boards so that they could be easily replaced with technological advances. They were connected to each other by a “bus of parallel electrical connections” and fixed that had connectors to insert the five basic boards. We decided to start building it with the parts and microprocessors available at that time, which we baptized as the “Automated and Computerized Technology” project using the initials. It was abbreviated as T.A.Co. It was a success, and we were supported by the general management of technological institutes to build 5 computers initially, with the option of completing 50, and in the future an estimate to supply all the technological programs in Mexico with the participation of all the students of these institutions.

Thanks to this project and the optimism of the students in their last semesters, many these were developed and documented, in addition to practical projects that replaced their theses, these focused on building many designs of digital and analog electronic equipment, from digital teaching boards, tablets to digital and analog boards. computer as electronic synthesizers of words in Spanish baptized as “Robot Voice (RoVo)” and being the first electronic synthesizer of words in Latin America, Ergonomic keyboards for easy text capture, commercial TV-based computer monitors, control tablets for motors and special electrical equipment, and many more. My former students of this institution sent me a video recorded in 1984, when we were training. “RoVo” to speak Spanish, sing and give an example of its use in teaching annex link: “<https://www.youtube.com/watch?v=QoulNI6DHUc&t=10s>” and the following figure shows the initial prototype of T.A.Co (Figure 1).



Figure 1: Computer Prototype T.A.Co. at ITCJ (1S83).

Student Wealth #4: "Sharing Acquired Knowledge"

The grandiose success of this project T.A.CO. was based on the specific objective of share acquired knowledge, as a basis to demonstrate the importance of continuing to update, create challenges with new designs, develop and build them integrating new ideas, sowing in students the need to be continuously preparing, and having the vision of leaving a mark on the educational institution that trained them, donating the teaching equipment to be used in the practical workshop classes, so that future students would learn in a more efficient way, and in turn also have the opportunity to sow again in them the evolution of new ideas with useful projects to the community.

Evolution with Leadership

Many students think that when they graduate from an institution, they will move on to a more practical stage were continuing to study is no longer so important and if they do so, they end up doing the same for years and when they decide to update, they are disconnected from the advances. That worked in the past, in times when international companies needed people in their manual manufacturing processes to save costs and sell their products at an affordable price. In these times of exponential technological revolution due to the use of Artificial Intelligence, we have the needs of "Nearshoring", where personnel are required

Highly specialized in designs and effective companies as active partners. The reality of this revolution is constant evolution with a need to learn to understand and handle new techniques. This is what identifies today's leaders, as They are always motivated, always balancing their available time with a smart and wise mindset. This should begin to be practiced in educational institutions; hence students must take several subjects with different experts and their respective practices and laboratories. It is easy to spot students without leadership, as they are always complaining that they have little time, that they are easily distracted by unproductive or unimportant things when taking classes... And then they have to spend time trying to understand what is explained in class. A student with leadership always puts his attention on the place where he is, takes advantage of it and even in those sessions' ideas are born to apply what he has learned immediately.

Student Wealth #5: "Evolution with Leadership"

Leaders are not people who just give orders and spend their time pressuring others to comply. It is true leaders who inspire and motivate people to work towards a common goal. Leaders manage to create their own companies and empires, always focused on updating their services and products with evolutions in cost and effectiveness in its use, and always continue to motivate others to join their projects and even help them pursue their dreams.

Grassroots Research for the Advancement of Society

Scientific research is the main basis for obtaining knowledge for the resolution of problems that affect society and help survival. In the current time there are powerful tools to analyze the neces-

sary information and learn to apply the results in numerous applications for different areas such as engineering in its many branches, medicines for different diseases, land, air and space transport using technology based on clean, renewable and sustainable energies, effective communication with many applications, improvements in designs with optimization of resources, and many areas that are continually evolving. Observational scientific methods, experimentation and critical reasoning to obtain effective conclusions. With characteristics of detailed observations including natural phenomena, experiments that are repeatable for other researchers to verify, controlled conditions to eliminate unrelated variables, which also allow the formulation of a hypothesis to be tested by experiments, which can be analyzed, interpreted and made predictions including natural phenomena and finally published so that it can be the seed for new research that can even modify the original hypothesis [4].

In the eighties, the experiences acquired by students, professors and directors helped to create the "Graduate Center" in this institution. offering the "Master's Degree in Industrial Engineering", where very productive research was carried out with symposia and forums every semester with the participation of many world-renowned researchers. Where it has currently evolved into the "Division of Postgraduate Studies and Research", offering various master's degrees such as "Administrative Engineering" and "Doctorate in Engineering Sciences".

Student Wealth #6: "Grassroots Research for the Advancement of Society"

Research should be part of learning in all educational institutions with the aim of making it part of the students' routine, and it should be consolidated with postgraduate studies in institutions for the benefit of the community in general.

Resilience

It is very normal in our student life and more frequent in the exercise of our profession to have unfavorable results with respect to what is expected in our goals. As a teacher, when grading exams and papers, some were not acceptable and I rejected them. Then I waited for the reaction of my students; It was easy to see those who were discouraged and felt sad and did not make plans to improve, while others arrived with optimism, they apologized and told me: "The next time I'll do much better..." and he used to answer them "... if in the next one he gets a better grade, I will help you to raise the grade of this stumble and forget it." Personally, my experience in the institution: 2 years after the project was born, there was T.A.CO a change of directors of the institution, and they decided to cancel this project to focus on other projects of their management period. It was very adverse news, but thank God we recovered quickly, and decided to start our own company based on all the positive experiences I had in the institution." When starting our business, we first study the market with surveys of future customers maquiladoras, in them we find many alumni and professors who are already integrated into the productive sector who supported us to grow rapidly with training services in computer systems, design services of technological solutions based on Nowadays, when I finished my

PhD studies in 2015, I focused on specializing and researching and publishing textbooks with a global scope of research results applying Artificial Intelligence, Biomechanics, neurological diseases, medicine, natural water cycle and others [5].

Student Wealth #7: “Resilience”

It is the ability to overcome adverse events in our life. Analyzing the errors, To view them only as a less productive passing experience and to turn it into an enrichment of experiences in order to avoid them in the future, lead to being able to develop successful plans despite circumstances to the contrary.

Conclusions

Table 1: Here we only summarize the main “student riches” that will be very useful during their lives, plus the others that the students themselves will discover during their own experiences.

The Seven Main Student Riches at the TEC de Juárez (ITC)		
1	Effective Learning	Learn where you are, and don't leave it for later
2	Balance of activities	Between academic, social, and sports knowledge
3	Continuous Update	Be up to date to generate ideas and create effective projects
4	Sharing knowledge	To continue evolving all
5	Evolution with leadership	Leaders grow by motivating and helping others
6	Research	It is a useful requirement in our professional life
7	Resilience	ability to overcome adverse events

The accumulation of the “seven major student riches” during student preparation, where many will be future teachers, researchers, qualified staff of companies, writers and entrepreneurs who help our society grow. These are summarized in the table below for easy access (Table 1). In summary, the ITCJ offers the student wealth to continue growing and preparing its students, professors and researchers for the present challenges with a futuristic approach with academic strength aimed at research, facilitating innovation and development of its own designs for the creation of new efficient and competitive products, strengthening the Mexico’s growth to achieve technological independence and create competition at the international level with new products and technological solutions for global benefit (Figure 2).

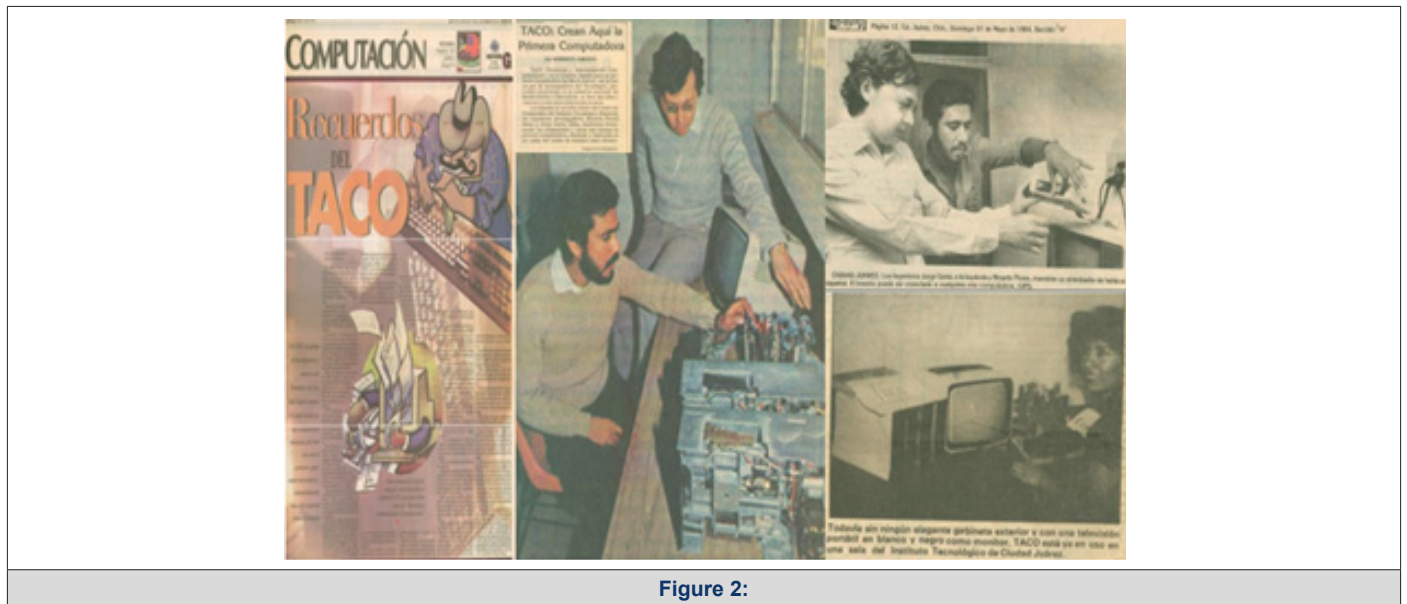


Figure 2:

Acknowledgement

None.

Conflict of Interest

None.

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