

Correlates of Student's Academic Performance in Machine Shop Technology of State Universities and Colleges

Catalino L. Centillas, Jr.

Palompon Institute of Technology-Tabango Campus
Tabango, Leyte, Philippines

Abstract

Regardless of one's major or field of specialization, machine shop technology specifically, plays a gigantic role in life. Thus, this study utilized the descriptive - correlational design ascertained students' academic performance on the profile of state universities and colleges; teachers' profile; and students' profile. Using a structured questionnaire, the data gathered were taken from different state universities and colleges offering Bachelor of Science in Industrial Technology major in machine shop technology. On the status of administrative support, the administrator revealed that there was adequate provision of tools and equipment in machine shop classes. The laboratory rooms of the state universities and colleges were adequate and the same with instructional facilities. With regards to the teachers' profile of those teaching in machine shop technology, they have quite long experiences in their respective schools. The results showed that teachers have long years of service in teaching the subject which could prove their expertise on their major field of specialization. On the students' profile, the level of attitude could be a strong motivation in doing well in their chosen vocation which resulted to acquire knowledge, habit and skills in machine shop technology. Based on the analysis of results, the administrators, teachers and students have favorable attitude towards the machine shop technology program.

Keywords: academic performance, machine shop technology, state universities and colleges, descriptive research.

Introduction

The growth and development of the nations depend to a large extent on the quality of its educational system as well on the capability approach to meet both individual and institutional requirement (Walker, 2006). To be effective in this responsibility, education needs to be of the right kind and right quantity in view of the realities of the society and the problems to be tackled. Though, education plays also a vital role in the development of one's country, it thus also ensures the acquisition of knowledge and skills that enable individuals to boost their productivity and widen their quality of life (Battle & Lewis, 2002).

On the other hand, the acquisition of knowledge and skills in technology subject is one of the way by which the nation trusts, to surmount the Millennium Development Goals (MDGs) by 2015 and the significant goal of the National Economic Empowerment and Development Strategies (NEEDS). On the other hand, the basic technology is believed to contribute to the

achievement of the national education goals by providing the required technical knowledge and skills of students (Nigerian Educational Research and Development Council, 2007).

Quality of education is not an unpretentious matter and density of this process increases due to the varying values of quality attributes associated with the different individuals' opinion. This is because success in technological development is the means for social and economic development. However, these explain why technology-related courses are always innermost among compulsory subjects that students' in the secondary education are required to pass for upward movement (Rijavec & Brdar, 2002).

Considering that there are circumstances or factors that bound student's achievements or learning, Barr, Burton, and Brueckner (1974) lend support to the position of Good by saying that supervision is an expert technical service that conditions learning and student growth.

According to Isidro (1962) "upon reaching maximum mental development, the individual does not grow anymore in mental ability but grows with wisdom and ripens with age." Maturation is an integral feature of the development of capacity. There are other factors to be considered like environment, opportunities to learn and the facilities needed or available.

Likewise, Doak and Lo (1996) emphasized that habits, attitudes and patterns of behavior of students that are established during the early years will determine to a large extent how successfully they will adjust to life as they grow older which would enable them to learn effectively. Moreover, their attitudes towards the subject under understanding of the relevance of the subjects to their future aspirations affect the students' enthusiasm for studying.

Andres (1981) expressed their views about the influence of education on the attitude formation. They said that work and values should properly be started in the classroom. They also cited that proper attitudes towards learning in the classroom serve as a means of cultivating one's value work. Andres also claimed that power work and favorable attitude go hand in hand. The most favorable attitude to develop for progress in learning is the attitude of success. He further explained that the most important things in studying is proper attitude, if proper attitude is not there, much of your studying can be so much time and effort wasted.

In the same manner, Aquino and Garcia (1974) stated that interest and attitudes are essential factors for evaluation of students' achievement in relation to certain educational objectives. Student achievement in technical courses or subjects can only be improved if the teachers teaching-learning process is competent enough is not only one particular aspect, but in all phases of the learning process.

According to Ramizo (1990) teachers should be aware of their role in creating an atmosphere conducive to learning. They must establish good rapport with their students. In this way, students feel at ease and comfortable during the teaching-learning process. Moreover, students are motivated to love schoolwork and improve their performance.

In addition, each family presents a unique environment for a child on the bases of contributions from her past. With its background, a family sets an environment for the child depending upon its financial status, its educational attainment, its cultural interest, and standard of moral values (Javier, 1993).

As a result, deficiency on scholastic achievement of students in school is related to the home background especially when its concerns social economic status of parents. The ability of

the parents to provide for the material needs and proper home environment is dependent on the family income and size of the family. Thus, family income could be one aspect that influences the competitive capability and performance of students in the classroom (Rothstein, 2004).

For that reason, it is only imperative to determine how the offering of this specific field of specialization responds the needs of the students in terms of their academic performance. It is also important to identify the problems and initiate measures on how we can improve the program. The researcher further recognized the need to identify and determined those factors affecting the performance, hence, this study. Based on the foregoing discussion, the researcher found it imperative to identify the factors affecting the student's academic performance in machine shop technology.

Statement of the Problem

This study determined the relationship of some selected factors to the student academic performance of fourth year college students in machine shop technology (MST) of the Bachelor of Science in Industrial Technology Curriculum of State Universities and Colleges. Specifically, it sought answers to the following questions:

1. What is the status of the machine shop technology program of State Universities and Colleges along the following aspects?
 - 1.1 tools and equipment; 1.2 laboratory room; 1.3 instructional facilities
2. What is the profile of machine shop technology teachers in terms of the following variables;
 - 2.1 educational qualification; 2.2 teaching experience; 2.3 teaching competence
3. What is the profile of the machine shop technology students in terms of the following;
 - 3.1 attitude towards the subject; 3.2 extent of parental support; 3.3 self-concept
4. What is the level of academic performance in machine shop technology of fourth year students of state universities and colleges?
5. Is there a significant relationship between the level of academic performance and the following correlates;
 - 5.1 status of state universities and colleges; 5.2 profile of MST teachers; 5.3 profile of students
6. What intervention scheme could be proposed to strengthen the implementation of MST of state universities and colleges?

Methodology

The descriptive correlational survey was used because according to Sanchez (1986), it is the most appropriate design as it is concerned with conditions of relationship that exist; practices that prevail; beliefs held, processes that are going on; effects that are being felt, or trends that are developing.

This research was a correlational analysis of the three (3) sets of factors under study namely, (1) the profile of state universities and colleges which include administrative support in terms of tools and equipment, laboratory rooms and instructional facilities; (2) teacher profile which covers educational qualification, teaching experience and teaching competence, and; (3) students profile which includes the attitude towards the subject, extent of parental support and

self-concept. These correlates were paired to the students' academic performance and tested further which of them would best predict students' performance.

The respondents of the study were the Deans and Heads of the college/department where MST is offered, teachers handling fourth year Bachelor of Science in Industrial Technology (BSIT) students major in MST of the identified state universities and colleges.

On the other hand, the researcher arbitrarily established a set of norms interpreting the mean scores obtained using the scale values described for the perception on the extent of adequacy of the MST tools and equipment, laboratory rooms and instructional facilities.

The procedures as well as the statistical tools used were Percentage, Weighted Mean and Person r. Percentage was used to measure the distribution profile of the respondents in terms of the identified factors.

Results and Discussion

This part presents the status of State Universities and Colleges in terms of administrative support, the profile of faculty members as well as the profile of students, which were tested in terms of their correlation to students' academic performance in Machine Shop Technology.

Status of Machine Shop Technology

This part presents the process of the school administrators on the offering Machine Shop Technology program. The concerns include the status of tools and equipment, laboratory rooms, and instructional facilities used in Machine Shop Technology program of state universities and colleges.

Tools and Equipment

As shown in Table I, the status of tools and equipment of state universities and colleges as revealed by the MST teachers and Administrators. The groups of respondents rated the tools and equipment as "adequate" with mean scores of 4.04 for teachers and 3.98 for administrators. These findings reveal that both the teachers and administrators as perceived that MST shops are adequately provided.

Table I: Status of Tools and Equipment in the State Universities and Colleges As Perceived by Teachers and Administrators

Tools and Equipment	Teachers		Administrators	
	Mean	Interpretation	Mean	Interpretation
1. Ball pen Hammer	4.6	very adequate	4.4	Adequate
2. 2. Bench vise	4.4	Adequate	4.2	Adequate
3. File	4.6	Very adequate	4.8	Very adequate
4. Hacksaw	4.4	Adequate	4.6	Very adequate
5. Micrometer	3.6	Adequate	4.0	Adequate
6. Scriber	3.8	Adequate	4.0	Adequate
7. Steel Tape	3.8	Adequate	4.0	Adequate
8. Try square	4.2	Adequate	4.0	Adequate
9. Vernier caliper	4.4	Adequate	4.6	Very adequate
10. Wrenches	3.7	Adequate	3.8	Adequate
11. Acetylene	2.8	Slightly adequate	3.0	Slightly adequate
12. Bending machine	3.0	Slightly adequate	3.0	Slightly adequate
13. Drilling machine	3.0	Adequate	4.0	Adequate

14. Engine lathe machine	3.4	Slightly adequate	4.0	Adequate
15. Milling machine	3.2	Adequate	3.6	Adequate
16. Welding machine	3.4	Slightly adequate	3.6	Adequate
Overall	4.04	Adequate	3.98	Adequate

With regards to the specific items considered in this study, the teachers rated the “ballpeen hammer” and “file” to be “very adequate” with identical mean scores of 4.6. On the administrators group, the highest rated item was “file” followed by the “hacksaw” with mean scores of 4.8 and 4.6 respectively. These findings reveal that the basic tools such as file, hacksaw and hammer are very much available in MST shops.

On the other hand, the items with the lowest mean score ratings by the teacher respondents were “acetylene” and “bending machine” with respective means of 2.8 and 3.0. The administrators group gave the lowest mean scores to “acetylene” and “bending machine” also. The findings attest that these two equipment are “slightly adequate” in MST shops of the five technological state colleges. This implies that the administrators of these schools cannot adequately provide such equipment because these are expensive.

Laboratory Rooms

Table 1-A presents the status of laboratory rooms used for MST instruction. As revealed in this table, the nine enumerated items were perceived by the respondents to be provided “adequately” with an overall mean score of 3.89 for teachers and 4.13 for administrators. These findings mean that instruction in Machine Shop Technology could go on smoothly because of the high level support given by the teachers and administrators. Laboratory rooms are well accorded to support instruction that would afford meaningful learning and ultimately would result to gainful employment of the graduates in this area of specialization.

Table I-A: Status of Laboratory Rooms of State Universities and Colleges

ITEMS	Teachers		Administrators	
	Mean	Interpretation	Mean	Interpretation
1. Cabinets	4.0	adequate	4.2	adequate
2. Comfort Rooms	3.6	adequate	3.8	adequate
3. Electrical outlets	4.0	adequate	4.0	adequate
4. Illumination	3.8	adequate	3.8	adequate
5. Safety first aid kit	4.2	adequate	3.8	adequate
6. Space	4.8	Very adequate	4.6	Very adequate
7. Student lockers	3.2	Slightly adequate	3.8	adequate
8. Water fixtures	3.6	adequate	4.2	adequate
9. Working benches	3.8	adequate	4.6	Very adequate
Overall	3.89	adequate	4.13	adequate

With regards to the specific items considered in this study, the teachers rated the “space” to be “very adequate” with a mean score of 4.8. On the administrators group, the highest rated item was “space” and “working benches” to be “very adequate” with identical mean scores of 4.6. These findings reveal that the administrators and teachers adequately provide the laboratory rooms with the standard requirements.

Instructional Facilities

With regards to the instructional facilities in the Machine Shop Technology shops, Table II-B shows the status of instructional facilities. As provided by this table, the eight enumerated items were perceived by the respondents to be provided “adequately” with an overall mean score of 3.6 for teachers and 3.9 for administrators. The results revealed that there were enough instructional facilities in Machine Shop Technology that the administrators provide as support. This implies that teachers and students enjoy the high support afforded by the administrators of state universities and colleges offering Machine Shop Technology. The administrators perceived classes were provided with much support in terms of instructional facilities.

Table I-B: Status of Instructional Facilities of State Universities and Colleges

ITEMS	Teacher		Administrator	
	Mean	Interpretation	Mean	Interpretation
1. Books	3.6	adequate	4.0	adequate
2. Chairs	4.6	Very adequate	4.6	Very adequate
3. Flip charts	3.8	adequate	4.0	adequate
4. Instructional sheets	3.6	adequate	3.6	adequate
5. Journals	3.0	Slightly adequate	3.4	Slightly adequate
6. Magazines	3.2	Slightly adequate	3.6	adequate
7. Manuals	3.4	Slightly adequate	3.8	adequate
8. Modules	3.6	adequate	4.2	adequate
Overall	3.6	adequate	3.9	adequate

The table further reveals that one item was perceived to be “adequate” as indicated by the obtained identical mean scores of 4.6. There were four items interpreted as “adequate”. These items were: books, instructional sheets, and modules, having a mean score of 3.6 flip charts with a mean score of 3.8 for teachers and for the administrators the interpretation were the same. The item that was perceived to be “slightly adequate” was journals, magazines, and manuals with mean scores of 3.0, 3.2, and 3.4 respectively, for teachers and for administrators there were only one item that was perceived to be “slightly adequate” with a mean score of 3.4. These findings reveal that both the teachers and administrators of MST program perceived the instructional facilities in the MST shops as adequately provided.

Summary of the Administrative Support

Table 1-C shows the summary of perceptions of the teachers and administrators of state universities and colleges offering Machine Shop Technology. It is evident that the three areas presented to them obtained mean scores interpreted as “adequate”. This means that the teachers and administrators were supportive enough to the offering of Machine Shop Technology. It further implies that the status of support accorded to the Machine Shop Technology facilities in terms of tools and equipment, laboratory and instruction facilities is “adequately” as perceived by the teachers and administrators of state universities and colleges.

Table I-C: Summary of the Status of Administrative Support of Administrators and Teachers of MST of State Universities and Colleges

FACTORS	Teacher		Administrator	
	Mean	Interpretation	Mean	Interpretation
1. Tools and Equipment	4.04	adequate	3.98	adequate
2. Laboratory Facilities	3.98	adequate	4.13	adequate
3. Instructional Facilities	3.6	adequate	3.9	adequate
Grand Overall	3.84	adequate	4.00	adequate

Profile of Machine Shop Teachers

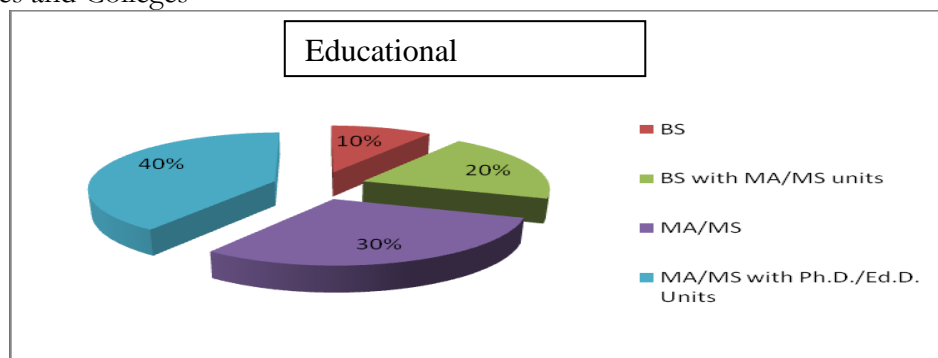
The status of faculty members in Machine Shop Technology along their educational qualification, teaching experience in MST and teaching competence are revealed in this section. The 10 teachers revealed themselves as follows;

Educational Qualifications

Among the 10 respondents there were four or 40 percent who were MA/MS with units in the doctorate program, while three or 30 percent were full- pledged MA/MS without doctorate units. On the other hand, there were two or 20 percent BS degree holders with units in the masters program and one or 10 percent had BS degree without MA/MS units.

The findings reveal that majority of the faculty members in the Machine Shop Technology specialization of the five state universities and colleges under study were MA/MS holders. This means that the faculty members are highly qualified to handle the subject in as far as their educational qualification is concerned. It is expected that they students with mastery and expertise of the subject matters in Machine Shop Technology.

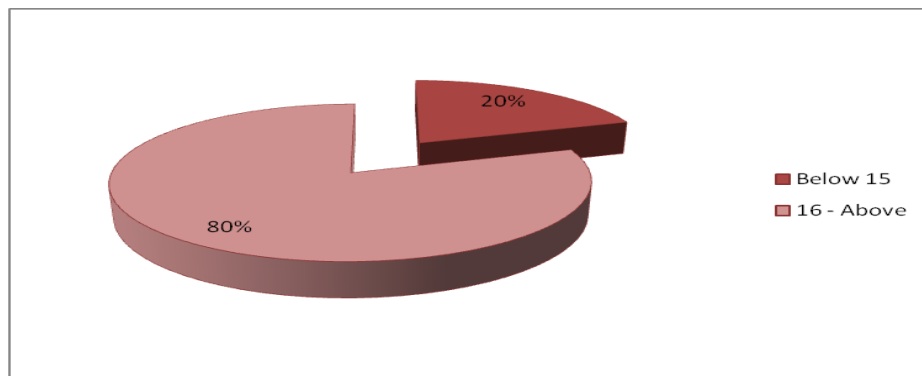
Figure 1: Educational Qualifications of Machine Shop Technology Teachers of State Universities and Colleges



Teaching Experience

The teaching experience of the Machine Shop Technology teachers is revealed in figure I1. It is depicted in this table that eight or 80 percent of the respondents had 16 years or more teaching experience on the subject, while only two or 20 percent had 11-15 years teaching experience in machine shop. The results show that Machine Shop Technology teachers have quite a long number of years experience in handling the subject. This number of year experience in teaching Machine Shop Technology could be very useful tool of these teachers to harness their expertise in the field. Their experience could also assure students that they will be able to receive adequate skills and knowledge from their respective teachers.

Figure II: Teaching Experience of Machine Shop Technology Teachers of State Universities and Colleges



Competence of Teachers

The competence of teachers in Machine Shop Technology revealed themselves to be “competent” as they obtained grand overall mean score of 4.4. This means that faculty members in Machine Shop Technology perceived themselves to be competent in instructional and evaluative jobs that they have. As revealed in table II-B, the overall mean score obtained in the area of mastery of subject matter and evaluative techniques were 4.4, respectively interpreted as “competent”.

There were two items under mastery of the subject that were perceived to be “very competent”, these are “shows evidence of mastery of subject matter” and “gives reasonable

Table II: Level of Competence of Machine Shop Teachers of State Universities and Colleges

Items	Mean	Interpretation	Rank
A. Mastery of the subject matter			
1. Shows evidence of mastery of subject matter.	4.6	Very Competent	1.5
2. Motivate effectively the students for the lessons and tasks	4.3	Competent	3
3. Uses varied instructional materials aids, devices in achieving teaching goals	4.2	Competent	4
4. Gives reasonable assignments	4.6	Competent	1.5
Overall	4.4	Competent	
B. Evaluation Techniques			
1. Conducts regular assessments of students	4.5	Competent	2
2. Analyzes and interprets evaluation results appropriately	4.2	Competent	
3. Uses appropriate evaluation techniques for students' assessment	4.3	Competent	4
4. Observe the art of questioning in the preparation of questions	4.6	Very Competent	1
5. Utilizes evaluation results as bases for improving instruction	4.4	Competent	3
Overall	4.4	Competent	
Grand overall	4.4	Competent	

assignments" with identical scores of 4.6. However, there were also two items perceived to be “competent”, these are “motivate effectively the students for the lessons and tasks” and “uses

varied instructional materials, aids/devices in achieving teaching goals” with mean scores of 4.3 and 4.2 respectively.

On the other hand, on the part evaluative techniques one item was perceived to be “very competent” and the rest were “more competent”. The item perceived to be very competent was “observe the art of questioning in the preparation of questions”. The results revealed that there are skills of teachers that they perceived to be much competent and more competent where they need to maintain and improve, respectively to afford maximum learning to students.

Profile of Students

In this part, the profile of students with regards to their attitude towards the subject, extent of parental support and self-concept are presented.

Level of Students Attitude towards MST as a Subject: Shown in Table III is the level of attitude by the students in Machine Shop Technology of state universities and colleges

Table III: Level of Students Attitude Towards Machine Shop Technology as a Subject

Scale	Description	F	%	Rank
42-50	Very High	28	90.32	1
34-41	High	3	9.68	2
Total		31	100	
Average :		48.1		very high

It is evident that the students have a very high attitude towards machine shop technology as a shop course. This is revealed by 28 respondents or 90.32 percent, while only three or 9.68 percent answered “high”. These findings clearly indicate that students taking machine shop technology as major are positive that this shop course will give them the desired skills and competencies to be productive in the future. It implies further that their positive attitude towards machine shop technology could propel them to succeed whatever they will have to endeavor in their live in the near future.

Extent of Parental Support:

Table III-A presents the extent of parental support that the students in Machine Shop Technology received. All of the 31 respondents or 100 percent revealed that they enjoy a “very great extent” of parental support. This means that the parents of students taking up machine shop technology were very supportive to their children’s chosen field of specialization. This implies that the parents are with their children when these students chose their shop course and the parents are also supportive as to the needs of the students in terms of their studies especially if it concerns their major field of specialization which is machines shop technology.

Table III-A: Extent of Parental Support to the Machine Shop Students of State Universities and Colleges

Scale	Description	F	%	Rank
42-50	Very High	31	100	1
Total		31	100	
Average :		49		very great

Level of self-concept

The level of self-concept of students in MST has a “very high” level of self-concept as shown in Table III-B. It was revealed by 31 or 100 percent of the respondents. It means that students taking MST have a very high regard of themselves. These students don’t have qualms about their

shop major. They could even be proud of it as they have a very high average score which is 49. This implies that students taking MST as shop course have very high regard to their major and this high regard could motivate them to excel in this area of specialization.

Table III-B: Level of Self-Concept of Machine Shop Students of State Universities and Colleges

Scale	Description	F	%	Rank
42-50	Very High	31	100	1
Total		31	100	
Average :		49	very high	

Academic Performance of the Students

In this part, the level of academic performance by the Machine Shop Technology Students is revealed.

Level of Academic Performance

Eighteen out of 31 students or 58.07 percent got an academic performance on the level of 2.10 – 2.50 interpreted as “satisfactory”. On the other hand, there were 11 students or 35.48 percent obtained grades on the level of 1.60 – 2.00 interpreted as “very satisfactory”, while there were two or 6.25 percent achieved the level of 1.00 – 1.50 interpreted as “outstanding”. On the average the students have obtained an academic achievement of 2.10 that falls on the level of “satisfactory.”

The preceding data signify that the level of academic achievement by the machine shop technology students is on the average or satisfactory. This means that the students in the said shop course are doing a satisfactory performance in as far as their academic pursuits are concerned.

Table III-C: Level of Academic Performance of Machine Shop Technology Students of State Universities and Colleges

Level	f	%
1.0 – 1.50 (outstanding)	2	6.25
1.50 – 2.00 (very satisfactory)	11	35.48
2.10 – 2.50 (satisfactory)	18	58.07
Total	31	100
Average:		2.06 or 2.01
(Satisfactory)		

Relationship among the Identified Variables

This part of the study relates the academic performance which is the identified dependent variable to the three independent variables assumed to influence the former. Hence, the following results: **Academic Performance and Status of State Universities and Colleges.** The computed value of 0.292 is lower than the tabular value of 0.3557, $df = 29$ at 0.05 level of significance. In this case the relationship between the status of the technological state college and the student academic performance is interpreted to be “not significant”. This means that academic performance of students in Machine Shop Technology is not significantly affected by the status of the technological state college. This implies that the tools and equipment, laboratory facilities and instructional facilities in Machine Shop Technology has nothing to do with the academic performance of the students. This further means that whether there are necessary facilities or none the academic achievement of the students will remain.

Academic Performance and Profile of MST Teachers

On the part of the teachers' profile, the relationship revealed a "not significant" interpretation. The relationship of the two variables yielded a computed value of 0.167439 which is lesser than compared to the tabular value 0.3557, $df = 29$ at 0.05 of significance. This result means that the academic performance of students in machine shop technology is not significantly influenced by the educational qualification, teaching experience in MST and teaching competence of teachers. This gives the implication that whether MST teachers have high or low educational qualification, have long or short teaching experience and highly competent or not, these variables have nothing to do with the level of the students' academic performance.

Academic Performance and Profile of MST Students

The computed r-value yielded and insignificant value of 0.120206 compared to the tabular value of 0.3557, $df = 29$, set at 0.05 level of significance. This finding revealed that academic performance of students is not significantly influence by their attitude towards the subject, extent of parental support and self-concept. This implies that whether students have favorable or unfavorable attitude towards the subject, have high or low support by parents or have high or low self-concept their academic performance in MST will still be the same.

With the above findings, the null hypothesis which states that there is no significant relationship between the academic performance of students in MST and the three identified variables is accepted. This means that academic performance of students in MST is not influence by the school, teachers and students variables.

Conclusion and Recommendation

Based on the analysis of the findings, the school administrator of state universities and colleges perceives that the machine shop classes are provided with tools and equipment, laboratory room and instructional facilities. Teachers in MST have teaching experience of more than 5 years and are very much competent in teaching the shop major. The students of MST have average attitude towards the subject, enjoying parental support to a great extent and a high self-concept. The level of academic performance by the students in MST is satisfactory. There is no significant relationship between the identified variables, namely: status of state universities and colleges, MST instructors' and students' profile to the academic performance of the MST students.

Although it was found out that the MST program was well taken care of in terms of provision of facilities, teacher, the administrator should find ways and means to increase the enrolment. Incentives for students enrolled in this program should be given a percentage from income of the shop through IGP. Moreover, a scheme should be designed such as collecting laboratory fee for MST shop only to be purchased for machines and equipment so that students will be encouraged to major MST and Linkages with other agencies should be established. Finally, the school administrator should do this by having tie-up with private industries that would serve as the training venue of the students in their OJT training. The designed intervention scheme should be followed by the school administrator in order that the MST offering of state universities and colleges should be a training venue comparable to international standards.

The Proposed Intervention Scheme

Assessing the strengths and weaknesses of state universities and colleges, the following model is hereby proposed. This proposed scheme was based on the SWOT analysis.

Table IV: Intervention Scheme

Area of Concern	Strength	Weaknesses	Opportunities	Threats	Possible Course of Action
A. School					
1. Tools and equipment	slightly adequate	Sub-standard tools and equipment	Maximize the utilization of tools and equipment	Budget	Centralize the shop for MST Where there will be resource sharing
2. Laboratory room	adequate	Worn-out/dilapidated	Maximize the room utilization	Budget	Raise fund to buy the needed tools and equipment
3. Instructional facilities	adequate	Obsolete	Revise, update instructional facilities	Budget	Conduct seminar workshop to develop instructional materials
B. Faculty	Qualified	Turn-over of instructors	Productive and highly performing faculty	Transfer/ Pirating of instructors	Strengthen faculty development program
1. Educational Qualification					
2. Teaching experience	Long years	Retirement	Productive and highly performing faculty	Transfer/ pirating of instructors	Conduct regular supervision of faculty
3. Teaching competence	Competent	Burn-out faculty/lack of challenge	Productive and highly performing faculty	Transfer/ pirating of instructors	Evaluate and implement faculty ranks
C. Students					
1. Attitude towards MST	Favorable	Amor-propio	Productive and highly performing students	Exploitation by instructors	Motivate students by encouraging them to engage in IGP
2. Extent of parental support	Great extent	Dependence	Productive and highly performing students	Drop-out to look for jobs	Provide incentive for students who are into IGP's
3. Self-concept	High	Amor-propio	Productive and highly performing students		Involve the students in the sourcing, canvassing and purchasing of equipment and machines

The acronym stands for Strengths, Weaknesses, Opportunities and Threats. It is a technique of information gathering, analysis and evaluation. It is applied in identifying the strength, weaknesses, opportunities, and threats in a given situation, at a given time of a community as an organization of individuals. The strengths are conditions, qualities and resources that enhance productive performance and therefore contribute to growth. Weaknesses are on the other hand, conditions, qualities and inadequacies that negate growth or serves as impediments to productive performance. These conditions, qualities, resources and inadequacies refer to what is here and now. Opportunities are circumstances that credit favorable conditions in implementing action and achieving objective or purpose. Threats on the other hand, are circumstances that create undesirable result unproductive outcome or total destruction. Both opportunities and threats on this context may or may not happen, so that in points of time and action it is yet to come or happen.

References

- Andres, T. Q. D. (1981). *How to study effectively*. Homelife Publishers, Sandy, Utah.
- Aquino, G., & Garcia, L. (1974). *Fundamentals of Measurement and Evaluation*. Quezon City: National Bookstore Inc.
- Barr, H. S., Burton, V. N., & Brueckner, L. (1974). *Supervision*. New York: D. Appleton Century Company.
- Battle, J., & Lewis, M. (2002). The increasing significance of class: The relative effects of race and socioeconomic status on academic achievement. *Journal of Poverty*, 6(2), 21-35.
- Doak, P., & Lo, B. (1996). *Students' Attitude Towards Math and Science*. Center for Computer and Math, Southern Cross University, Australia, Computer Internet.
- Isidro, A. (1962). *Principles of Education Applied to the Philippines*. Phoenix Press, Inc., Quezon City.
- Javier, R. V. (1983). *The Influence of Home in Child Development*. The Modern Teacher. No. 10.
- Nigerian Educational Research and Development Council. (2007). *9-Year Basic Education Curriculum: Basic Technology for Junior Secondary 1-3*, NERDC Press.
- Ramizo, F. G. (1990). Personality Trait: Their Effect on Students Performance. *The Filipino Teacher*, 44(1).
- Rijavec, M., & Brdar, I. (2002). Coping With School Failure and Self-regulated Learning. *European Journal of Psychology of Education*, 17(2), 177-193.
- Rothstein, R. (2004). *Class and school: Using social economic and educational reforms to close the white and black achievement gap*. Teachers College, Columbia University ; Washington, D.C. : Economic Policy Institute.
- Walker, M. (2006). Towards a capability-based of social justice for education policy-making. *Journal of Education Policy*, 21(2), 163-185.