

High School Students' Reasoning Skills and Their Study Habits and Attitude Towards Learning

Maricris B. Acido

Introduction

A major task of education programs is to come up with guidelines and tools to enable students to learn effectively. This is to ensure that students are able to acquire skills for them to carry out their academic and problem solving tasks. UNESCO acknowledges that:

On the eve of a new century, there is an unprecedented demand for and a great diversification in... education, and for building the future, for which the younger generations will need to be equipped with new skills, knowledge, and ideals (UNESCO, 1998).

The profusion of knowledge and information has led to an increase in the number of issues that students need to resolve inside and outside the school. Knowledge explosion also demands prudence and careful discernment from students who are to choose more relevant and sound data. This would require the acquisition of *reasoning skills* that would enable them to filter relevant information from irrelevant ones. *Reasoning* involves providing arguments, premises, justification, and evidence to claims or positions.

However, acquisition of reasoning skills requires much from students. It requires *good study habits and positive attitudes*, as well as good contextual reinforcers and influences. Many educators have noted that learning is dynamic and that it does not occur in a vacuum. Learning happens due to various factors and influences.

It is, therefore, important to direct research efforts in education towards the study and analysis of how these variables facilitate student learning. For this reason, this article focuses on students' study habits and attitude towards learning and how these influence their acquisition of reasoning skills. It is hoped that student learning can be effectively enhanced by tapping on what students already have in them: the capacity to regulate their study habits and to positively direct their attitudes towards learning.

Reasoning skills and student learning

Reasoning entails presentation of arguments for conflicting views or positions on an issue. Paul & Elder (2006) provide a checklist for reasoning, which primarily highlights giving "inferences by which we draw conclusions and give meaning to data" (p.7). They also emphasize that reasoning "has implications and consequences" (*ibid.*). Toulmin (2000) moreover underscores the requirements of reasoning which involve "examination of the claim or position in any given issue, and analysis of the evidence and justifications offered to support such claim, along with an analysis of the refutations offered" (p.26). Hence, *reasoning skills* involve the analytic skills of identifying sound claims or positions from unsound ones such that only applicable and sound consequences could be achieved.

It is acknowledged that students need to give positions and decisions on, and to resolve, various issues. This, in turn, demands from them clarity of ideas, justifications of claims, and the passion for critical thinking that are usually taken for granted. Reasoning skills are thus essential to students since they need to be able to discern and make valid and correct decisions on issues and problems concerning their academic and life environments. Moore & Bruder (1996) highlight the importance of reasoning skills to learning:

(Reasoning) skills help students think clearly and logically, as answers to issues and problems usually entail making careful distinctions in

arguments and as solutions to these issues also require logical and critical thinking (p.88).

These skills also help students keep an open mind in the face of conflicting ideas or opposing views and "seek solutions that meet standards of coherence and reasonableness" (*ibid.*). Doronila (1998) highlights the fact that students need to develop a "range of skills and competencies which would enable them to live and work as human persons, develop their potential, make critical and informed decisions, and function effectively in society". Her study on the Philippine educational system emphasizes the country's need to teach its students functional literacy skills, which include the skills to make good decisions on issues.

Classical literature written about the teachings of Socrates, and even writings of Plato, Aristotle, and other medieval and modern thinkers on student learning and their acquisition of knowledge, have noted the importance of reasoning skills in the analysis of academic and life issues (Kleinig, 1982; Ozmon & Craver, 1995; Moore & Bruder, 1996). To date, various authors have emphasized students' need for skills that would help them make valid decisions on their tasks (Honer & Hunt, 1996; Ibe, 1999; Paul & Elder, 2006). Local studies (Muega, 2003; Acuna, 2000; Orteza, 1999) have also stressed the need for students to acquire reasoning skills that would enable them to think critically and to make the right decisions claims on issues.

Study habits, attitude towards learning, and students' acquisition of skills

Research done on the topic of learning in general points to the important role major contextual influences play in either the enhancement or retardation of learning. Major contextual influences include the students' environment, family, and historical and cultural contexts which influence their learning (Dasen, 1975; Ortinero, 2000; Papalia, Olds and Feldman,

2004). Ortinero (2000) particularly highlights the role of family and environment in students' acquisition of rational capacities and skills.

It has been scientifically confirmed that family upbringing, neighborhood culture, schooling experience, and the national milieu positively or adversely affect the shaping of rational capacities (p.56).

Foreign and local literature on students' academic skills and performance revealed that variables like study habits, personality, and motivation are also considered to be very important in the acquisition of skills, especially reasoning skills (Weiner, 1972; Benbow & Armand, 1990).

Study habits and attitude towards learning are two variables worth noting, especially their impact on students' acquisition of reasoning skills. Various researches done on what constitutes good study habits point to the following common elements: a) being organized in terms of notes, lessons, materials; b) having a regular time and place for studying lessons, and making decisions about priorities concerning time and goals; c) good parental models, early and consistent parental supervision, and learning-conducive home culture and environment; and d) personal responsibility over what one does and does not do (Covey, 2007; Landsberger, 2007; Charnley, 2006; Zolten & Long, 1997).

Positive attitude towards learning also enhances one's chances of acquiring reasoning skills. The study of Benbow & Armand (1990) confirms an obvious observation that a student's interest in things that he or she needs to learn determines his or her acquisition of certain skills or abilities. Researches which explored this variable highlight the following factors: an interest towards intentional learning; investing extra effort beyond what is required to learn an idea or skill; anticipating the future use of an idea or skill being learned; and directing interests towards learning something (Rusbult, 1992; Huitt, 2001).

It is believed that good study habits and positive attitude towards learning proven in many studies enhance the processes of learning particular skills, including reasoning skills. Good study habits lead to enhancement in learning, as "ability improves and sharpens through mastery of principles and by means of training, exercise and constancy of application" (Ortintero, 2000, p.56). Weiner's (1972) study postulates that ability, as well as effort given by students to their studies, affects the acquisition of thinking skills and academic performance.

Methodology

Design

The study employed mixed-method design, as it primarily aims to describe existing facts and provide baseline data on high school students' study habits and attitude towards learning and their reasoning skills. Hence, baseline data are presented descriptively. Moreover, correlation between students' reasoning skills and their study habits and attitude towards learning are also presented.

To gauge the level of students' reasoning skills, their papers on an educational issue (*Which medium of instruction to use in teaching high school subjects*) were content analyzed by the researcher and two other experts using a researcher-made and expert-validated reasoning skills template. The template was given to the students only during the period when they needed to write their papers. They were also asked to write their papers inside the classroom, and were not to use any reference materials. These steps were followed to ensure control of variables.

Questionnaires were used to determine the students' study habits and attitude towards learning. Also, interviews were done on philosophy experts, teachers, and educators for additional insights on the variables involved in the study.

Research locale and participants of the study

One hundred-fifty (150) fourth year high school students were randomly selected. There are 103 female and 47 male students. All of them are within the age range of 15 to 17 years old. All of them have not had formal studies in philosophy and logic, but have been taught the rules and procedures of reasoning, as well as the fallacies involved in argumentation, by their teacher in journalism and writing class.

To further enrich and substantiate the data gathered, three philosophy experts and teachers of logic, philosophical analysis and reasoning, and education teachers and experts were requested to give their views and ideas on the importance of good study habits and positive attitude towards learning in the acquisition of reasoning skills.

The study was conducted in a public high school in Quezon City, Philippines. Students in this school come from diverse family and economic backgrounds.

Instruments

Template for reasoning skills: The template (see next page) offers a comprehensive set of guides or procedures that gauge reasoning skills. Through a series of questions focusing on reasoning skills, the students are able to clarify concepts, define terms, present arguments and counter-arguments, analyze these arguments and counter-arguments, and come up with a decision on the issue mentioned earlier.

These questions are the ones commonly used in reasoning and argumentation activities, and look into how well the students can provide reasons and answers to the issue presented to them and how well they could evaluate strong arguments and errors in reasoning. Three experts have validated this instrument.

Reasoning Skills Checklist/Template

1. State your argument/position/conclusion on the dilemma/issue in clear and simple terms and support such position/conclusion by providing at least three (3) but not more than five (5) premises.
2. Evaluation of Arguments/Position
 - a. Identify strong and weak premises and arguments.
 - b. Identify errors in reasoning (fallacies).

Questionnaire on students' study habits: The expert-validated questionnaire looked into the time spent by a student in studying his or her lessons, as well as the reasons and factors that promote and hinder studying of lessons. Sample items include "the length of time spent in studying lessons," and "adaptability to various kinds of learning environments.

Questionnaire on students' attitude towards learning reasoning skills: The expert-validated questionnaire looked into students' estimation of the value or worth of having better reasoning skills and their interest in acquiring such skills.

Interview guide: This used the research variables (reasoning skills, students' study habits and attitude towards learning) as themes of discussions with experts.

The questionnaires, reasoning skills template, and the interview questions were made using concepts and data found in various literature that discussed reasoning skills, and students' study habits and attitude towards learning.

Data collection and analysis

The researcher determined the reasoning skills of high school students through a content analysis of their arguments on the issue presented. Three professors teaching philosophy, logic, and reasoning, including the researcher, checked and rated the papers, using a researcher-made and expert-validated reasoning skills

template. The professors and the researcher did a blind inter-rating of the students' papers, using 40/40 as rating scale. Percentile ranking was used to show students' scores, and the ranking became the basis for the classification of high school students' reasoning skills into below average (lower 33.33%), average (middle 33.33%), and above average (upper 33.33%) categories.

Questionnaires were used to determine students' study habits and attitude towards learning, while interviews were conducted on philosophy experts, teachers, and educators. The questionnaire on study habits classified students into having either good or poor study habits, while the questionnaire on attitude towards learning classified them into having positive or negative attitude towards learning reasoning skills.

Correlation statistics (chi square) was employed on students' reasoning skills and their study habits and attitude towards learning.

The interview guide which was used to get more insights from experts employed open-ended questions and provided for conversational setting, but still focused on key questions and themes related to the purpose of the study.

Results and Discussions

Baseline data on high school students' reasoning skills, study habits, and attitude towards learning

The baseline data on high school students' reasoning skills were obtained through content analysis of their papers on a specific issue. Scores and percentages were derived from the ratings of three experts using the reasoning skills checklist/template. The combined scores allowed for students to be grouped into below average, average, and above average reasoning skills. There were 103 female students, or 68.67%, and 47 male students, or 31.33%.

The data in Table 1 reveal that 110 (73.33%) high school students had average reasoning skills and only two (1.33%) had above average reasoning skills, while 38 students (25.33%) had below average ratings. Further analysis of the data shows that very few of the students had good skills in argumentation and in analyzing arguments. Many of them had inadequate knowledge of the rules of reasoning and of fallacies or errors generally involved in argumentation as well as the fallacies they committed in writing their papers.

Table 1. High school students' reasoning skills

REASONING SKILLS		
	frequency count	percentage
below average	38	25.33
average	110	73.33
above average	2	1.33

The two students with above average reasoning skills exhibited great degree of discipline and caution in the way they gave premises and justifications to their claims or positions. They were able to clearly identify strong and weak arguments and were also able to give evidence and support to their premises and justifications. They also had knowledge of the various fallacies involved in reasoning.

The students with average reasoning skills were able to show a certain degree of discipline in providing premises but were unable to give evidence to these in many instances. Some of them also lack knowledge of the various fallacies involved in argumentation.

Those with below average reasoning skills did not have any knowledge of argument structure and failed to give valid and sound premises to their positions or claims. Most of them did not have any idea about fallacies involved in reasoning.

Table 2. High school students' study habits

STUDY HABITS		
	frequency count	percentage
poor	65	43.33
good	85	56.67

Table 2 presents baseline data on high school students' study habits. It is shown that there is not much remarkable gap in terms of study habits, as of the 150 students, only 56.67% had good study habits while 43.33% had poor study habits.

Table 3. High school students' attitude towards learning

ATTITUDE TOWARDS LEARNING		
	frequency count	percentage
negative	48	32
positive	102	68

Table 3 shows the baseline data on students' attitudes towards learning. It is worth-noting that of the 150 students, there are more students (68%) with more positive attitude towards learning.

High school students' reasoning skills and their study habits

It is important to note the reasons and factors which influence high school students' acquisition of reasoning skills. It is particularly important to focus on their study habits and attitude towards learning and analyze how these variables come into play in the reasoning skills of various types of students—students with below average, average, and above average reasoning skills.

Data on students' study habits (see Table 4) show that 97.36% of the high school students categorized as having below average reasoning skills had poor study habits. Almost all of them admitted to not having studied their lessons on argument and reasoning and the fallacies. This is to be contrasted with high school students, of average and above average reasoning skills, who admitted to having reviewed their lessons on reasoning and argumentation. In particular, the two students who were categorized to have above average reasoning skills stated that they regularly and consistently study their lessons on reasoning and on other subjects as well. These data support the study done by Covey, 2007; Landsberger, 2007; Charnley, 2006; Zolten & Long, 1997 on the importance of students having regular time and place for studying lessons.

Table 4. High school students' reasoning skills and their study habits

STUDY HABITS				
High school students' reasoning skills	poor study habits		good study habits	
	freq.	%	freq.	%
below average	37	97.36	1	2.63
average	28	25.45	82	74.54
above average	0	0	2	100

Students with average and below average reasoning skills complained of noisy home environments, which they say hinder them from reading their notes and studying their lessons. This is compared with students' of above average reasoning skills, which showed very strong parental guidance and good parental modeling, especially in terms of academics and cognitive activities being pursued by the children.

Table 5. Relationship between reasoning skills and study habits

Chi-square Computed Value	Critical Value	Interpretation	Remarks
60.488	3.84	Significant	Reject the null hypothesis

$$a = .05 \quad d.f. = 3.84$$

Null hypothesis: Reasoning skills and Study habits are independent. Conclusion: Reasoning skills and study habits are not independent or there is a significant relationship between reasoning skills and study habits.

The students' study habit is also found to be positively correlated with reasoning skills. Table 5 shows a significant relationship between the two variables, and this finding is supported by previous researches and literature. Researches have pointed to these elements as crucial in students' learning and acquisition of skills: good parental models, early and consistent parental supervision, and learning-conducive home culture and environment (Covey, 2007; Landsberger, 2007; Charnley, 2006; Zolten & Long, 1997). The Department of Education's (DepEd) Monitoring and Evaluation Report for SY 2004-2005 also showed that 44% of the students who were under the Bridge Program cited parental neglect as a major hindrance to student learning (DepEd, 2005).

Moreover, education experts and philosophy teachers who were interviewed unanimously agreed that many of the skills that are needed to be learned in high school, reasoning skills being one of them, are

acquired and developed in students through consistent practice. Their insights confirm other research findings which showed that acquisition of certain skills is determined by mastery and training in these skills (Ortiner, 2000; Weiner, 1972).

Education experts and teachers are also in agreement that students learn skills more efficiently when they are assisted and helped by experts and mentors. This perspective is theoretically grounded in Vygotsky's theory of the Zone of Proximal Development in student learning and in the concept of "scaffolding". Vygotsky (1978) emphasizes that a student's cognitive development is a result of a dialectical process involving a student who learns better when helped by a mentor such as teachers and parents. Studies have also noted how support, aid, or "scaffolding" provided by experts or parents to children who are learning how to carry out a task is very important in these children's learning.

High school students' attitudes towards learning and their reasoning skills

Table 6. High school students' reasoning skills and their attitude towards learning

ATTITUDE TOWARDS LEARNING				
High school students' reasoning skills	negative attitude		positive attitude	
	freq.	%	freq.	%
below average	35	92.10	3	7.89
average	13	11.82	97	88.18
above average	0	0	2	100

The data results in Table 6 highlight the importance of students' having a positive attitude towards learning in their acquisition of reasoning skills. Ninety-two percent (92.10%) of high school students with below average reasoning skills do not consider reasoning skills as important in conducting and doing one's activities and tasks and do not have positive attitudes towards learning. This is compared with 88.18% of students with average reasoning skills, and 100% students with above average reasoning skills, who consider reasoning skills as important in fulfilling one's tasks and activities.

The two high school students with above average reasoning skills expressed their interest in argumentation and reasoning. This confirms the studies of Benbow & Armand (1990) highlighting student's interest in a particular task or activity as a major determinant in his or her acquisition of certain skills or abilities, and of Rusbult (1992), and Huitt (2001) stating that a student's intentional learning, and his or her anticipation of the future use of a skill, are also determinants of students' acquisition of skills.

Table 7. Relationship between reasoning skills and attitude towards learning

Chi-square puted Value	Com-	Critical Value	Interpretation	Remarks
84.4		3.84	Significant	Reject the null hypothesis

$\alpha = .05$ d.f. = 3.84

Null hypothesis: Reasoning skills and attitude towards learning are independent.

Conclusion: Reasoning skills and attitude towards learning are not independent or there is a significant relationship between reasoning and attitude towards learning.

Table 7 shows a significant relationship between students' reasoning skills and their attitude towards learning. This data support literature and research findings which pointed to a positive correlation between the two variables.

Aristotle's work viewed learning as having a threefold component, namely the teacher who is skilled, the skill being taught, and the student who is determined and willing to learn the skill (Gutek, 1988). Aristotle's theory presupposes that the student is determined and willing to learn for him or her to eventually acquire the skill. It is also grounded in constructivist theory which views learners as taking an active role in their own development, as goal-oriented agents who actively seek knowledge (Bliss, 1994), and who actively construct and reconstruct knowledge and understanding (Hodson, 1998).

The data which highlight the positive attitude towards learning of the two high school students' with above average reasoning skills also support other findings. The Department of Education's (DepEd) Monitoring and Evaluation Report for SY 2004-2005 revealed that students' who were observed to have positive attitude towards their classes (Bridge Program) have shown improved skills in Mathematics, Science, and English (DepEd, 2005). This confirms the importance of a positive attitude towards learning in one's acquisition of skills.

Education experts and teachers also affirm the role of students' positive attitude and interest in learning as major factors in their acquisition of reasoning skills. They noted that students have to be interested in what they are doing for them to be able to learn. They should have a positive view of things that they are learning, by relating this with their goals, and by viewing learning as an activity to be done for its own sake.

The experts and teachers' views are related with the study done by Houle (1988), which presented learning-oriented students as ones who seek knowledge for its own sake. These are students who have positive attitude towards learning because they take personal responsibility over what they do (Covey, 2007; Landsberger, 2007; Charnley, 2006; Zolten & Long, 1997). Patterson (1996) also noted that "students' learning depends on how students see themselves, on their knowledge about the topic, and on how they plan to use this new learning" (p.5).

Conclusion and pedagogical implications

High school students' study habits and attitude towards learning have been shown to play an important role in their acquisition of reasoning skills. Data have revealed that the major difference between students with below average, average, and above average reasoning skills centers on their study habits—whether they have good or bad study habits, and their attitude towards learning a particular skill—whether they are interested or not, are responsible for their learning or not, and take responsibility over what they do or not. It is an understatement to say that those with above average reasoning skills have good study habits and positive attitude towards learning.

It was also shown in the study that high school students' reasoning skills have significant relationship with their study habits and attitude towards learning. Students with good study habits had better reasoning skills than those students with poor study habits. Also, students with positive attitude towards learning had better reasoning skills than those with negative attitude towards learning.

Hence, learning institutions need to direct attention to the creation and implementation of strategies and other similar activities that would help students develop good study habits and positive attitudes towards learning. Learning institutions need to embrace the concept of a "learning community" by encouraging and institutionalizing parental, instructional, and peer mentoring programs to develop good study habits and positive learning attitudes among high school students. This would involve the creation, implementation, and monitoring of the *learning community and peer mentoring program*, which will, in turn, establish such program as an integral part of high school curriculum.

However, there is still much to be done to help high school students direct their attention and interest towards learning certain skills, reasoning skills included.

Data in this study have revealed the important role that parents, teachers, and other mentors play in directing students' study habits towards good and positive outcomes, as well as the importance of helping students relate their activities to future goals so as to positively shape their interests towards learning reasoning skills.

Finally, more research is needed to monitor the impact of learning communities and mentoring programs that develop good study habits and positive learning attitudes among students, particularly over the longer term. There are important questions to consider such as whether or not good study habits and positive attitude towards learning could determine only reasoning skills, or other skills as well, or whether other variables would also come into play, especially in student learning and acquisition of skills.

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