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Understanding the Dynamics of Triarchic Intelligences and Instructors Competence in the Landscape of Science Education: A Psychological Approach

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Abstract

Understanding the role of instructional leaders in the landscape of science education in any higher education institution becomes an avenue for a procreating development. In fact, dynamic in the teaching-learning process is highly appreciated when competence, empathy, and intelligence are intertwined. Using a descriptive-correlational research design, there were several facts revealed relative to triarchic intelligence and instructors' competence.

As emphasized, there was a 0.537 of r-value and 0.012 p-value to pacify the implication which stated that the triarchic intelligence and instructors' competence manifested a relationship. The competence of college faculty handling science-related courses is affected by its capacity either in an analytic, creative or practical perspective. Another salient point in this endeavor was that there was a 0.93 of f-value and 0.569 p-value in determining the variance of the responses from 4 different academic programs at Santo Tomas College of Agriculture Sciences and Technology.

Lastly, it was noted that the competence of the instructors in 4 programs in the college did not vary. Faculty members in the school have manifested knowledge, pedagogical skills, management, and traits toward work in a similar norm.

Keywords: Higher Education Institution, Instructors' Competence, Science Education, STCAST, Triacrchic Intelligence

I-Introduction

Universities and colleges emphasized the important role of the faculty. The engagement of its instructors must be observed that can be seen easily like completing instructional tasks. As the different academic entities faced the existing problems in the academe, the dynamics of triarchic intelligences for the instructors organize the instructions according to the competences. Furthermore, factors such as teaching approaches, negative attitudes toward the topics, lack of skills and lack of conceptual understanding, respectively pointed out as the features that could have been associated to the triarchic intelligences (Elona, 2012).

Moreover, the success of teaching-learning is observed because of the instructors' competence and empathy. Khan (2004) emphasized the significance of elevating the standard for professional teachers' ethical conduct and teaching abilities. It has been known the that quality teaching instructions consider the variety of contexts and circumstances in which teachers much function.

In addition, continuous efforts are made to ensure teachers' participation by providing diverse teaching setting and experience. Attributes, skills and knowledge's needed by all classroom teachers to function across are the three broad phases of the competencies. The competencies are actually applied to the specific teaching and learning context as demarcated by students' phases of school and learning areas.

In the Santo Tomas College of Agriculture Sciences and Technology in particular, it has been noted that while students perform exceptionally well when learning new information, they perform noticeably worse when taking courses that call on faculty members to use critical thinking skills. Student's performance in the college demonstrates this disappointing situation. These circumstances motivate the researcher to come up with the study.

Theoretical Framework

The study is anchored on the theoretical model of Walberg (1980), which explained associations between learning variables and science education learning outcomes. Specifically, the theoretical model included the intelligences and capacity of instructors where learning takes place and what learner the quality of instruction the learner gets.

Moreover, the concept of Sternberge (1999) postulates that triarchic intelligence has more to do with success in the real world than it does with success in the classroom. He insisted that in broadening the concept of intelligences, it must include a spectrum of daily individual's activities. With this, there is the Sternberg's Triarchic Theory which includes three factors: analytical, creative and practical.

Meanwhile, Vygotsky (1962) mentioned in his social learning theory that to help deduce how people how people learned in social context (acquired knowledge and information from each other) and informed how educators build activities communities that promoted and uphold learning. He propositioned that the interactions can be created by teachers and increases or maximize his ability to interact and socialize with others

Thus, the conceptual framework represents the relationship between triarchic intelligences and instructors competence in defining the teaching-learning process. Triarchic intelligences indicators are: analytic, creative, and practical. The competence of instructors is measured by the following indicators: knowledge of subject matter, teaching strategies and methodologies, classroom management, and professional characteristics or traits.

Conceptual Framework

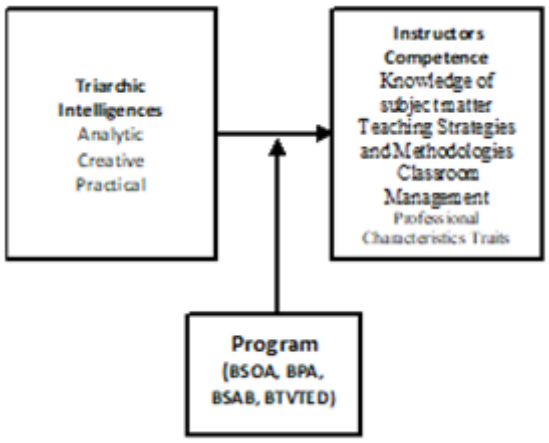

Fig. 1. Paradigm of the Study

Statement of the Problem

The study aimed to understand the role of triarchic intelligences to the competence of instructors in field of science education in Santo Tomas Davao del Norte (STCAST).

Specifically, it sought to answers the following questions:

1. What is the level of triarchic intelligences of teachers in STCAST along with the following areas:

    1.1. analytical,

    1.2. creative; and

    1.3. practical?

2. What is the level of instructor's competence in the field of science education along with the following areas:

2.1. knowledge of the subject matter;

2.2. teaching strategies and methodologies

2.3. classroom management; and

2.4. professional characteristics / traits?

3. Is there significant difference on the instructor's competence along with the program where they belong?

4. Is there significant relationship between the level of triarchic intelligences and instructor's competence in the field of science education?

Null Hypotheses

The null hypotheses were tested at the 0.05 alpha level of significance which stated as:

There is no significant difference on the instructor's competence along with the program where they belong and there is no significant relationship between the level of triarchic intelligences and instructor's competence in the field of science education.

Significance of the Study

The findings of this would be a great help of the following:

Students. The study is of benefit among students have information on instructors on the college feel and conform in the teaching-learning process. Also, it allows students how every teacher sacrifices a lot just to deliver quality and great lessons in every meeting.

Teachers: The work is helpful for the teachers to reflect on what to improve among themselves. Knowing once intelligences is very much important in order to allow them to know as to what aspects of their knowledge that can contribute on the development on their competence.

Program Heads. The study is meaningful in the sense that the result will be used in order to craft development plan or any framework. The output will serve as source of information to deal specific matter to what aspects of instructors' growth that ensures competence.

Future Researchers. This research will help future researchers looking for a basis who will be conducting similar researches to deeply explore triarchic intelligences and competence of instructors among local colleges and universities.

Scope and Limitation

The study was conducted at Santo Tomas College of Agriculture Science and Technology (STCAST). The data were taken during the second semester of the academic year 2021-2022. Another is that, the study participated by the entire programs offered of the college, Bachelor of Science in Office Administration, Bachelor of Public Administration, Bachelor of Technical Vocational Education and Bachelor of Science in Agri Business.

The result of the data is delimited only of the responses of the instructors. Specifically, faculty members of the different programs who are teaching science related subjects in STCAST in the Municipality of Santo Tomas.

Definition of Terms

The following terms which the researcher used in the study are lexically and operationally defined to provide clarity to the readers, to wit:

Triarchic Intelligences – refers to mental processes that are aimed at purposeful adaption to section from and shaping of real world surroundings that are important to an individual's life (Sternberg, R.J., 1997). As use in the study, triarchic intelligences pertain to analytical, creativity, and practicality of SCAST instructors.

Instructional Competence - refers to the teachers' expertise in instructional abilities, classroom management and assessment skills (Hasegawa, 2022). Relative to the study, instructional competence refers to the capacity of the faculty in conducting classes.

Science Education – pertains to the teaching and study of science content, social science, process, teaching pedagogy. As use in this study, science education pointed out science related subjects being taught by the college instructor of STCAST.

II-Methodology

This chapter of the research study presents the methods used by the researchers, including the research design, respondents of the study and sampling scheme, instrumentation and data collection, tools for data analysis and ethical consideration.

Research Design

The research used the descriptive-correlation research design. Pertinent data through the use of adopted questionnaire as the main data gathering tools in assessing triarchic intelligences and competence of instructor's competence handling science education related courses in Santo Tomas College of Agriculture Science and Technology.

As the term descriptive survey implies, the study involves in collecting data in order to describe the level of intelligences and competence of instructors. On the other hand, test of correlation was also utilized in order to test the degree of relationship between variables, triarchic intelligences and instructors competence.

Respondents of the Study

The respondents of the study were the entire faculty members of Santo Tomas College of Agriculture Science and Technology who are teaching science related subjects. In this investigation, the researcher employed universal sampling as a sample method. According to Kebara, (2009) universal sampling is the process of choosing a sample where not every member in the population has the same chance of being chosen and every individual's chance of being selected is unknown.

Instrumentation and Data Collection

The researcher used a questionnaire checklist instrument to gather and collect the necessary information for this research study. The researcher sought the professional assistance of the researchers resulted into the adoption of research tool.

The researcher sought permission from his research unit and program heads in order conduct the research in the college. The researcher personally distributes the questionnaires. The researcher gathered the profile of the respondents and the other relevant information to be needed for the intake of the present study for each of the respondents in the form they have answered.

The respondents were personally given a questionnaire checklist answered by the respondents. The respondents will be dealing on the items on the level of triarchic intelligences and instructors' competence. Upon completing the questionnaire given, the researcher collected and tabulated the survey and interpreted the results.

Tool for Data Analysis

Several statistical treatments of data were utilized to answer the problems established in this study accurately. To come up with a clear and accurate knowledge interpretation, the statistical measures listed below are described in further detail.

To answer problem number 1 and 2, which deals with the level of triarchic intelligences and instructor's competence, weighted mean was used.

The rating scale was used in determining the level of triarchic intelligences of college instructors of Santo Tomas College of Agriculture Sciences and technology:

Point Value	**Descriptive Equivalent (DE)**
4.20 – 5.00	Very High
3.40 – 4.19	High
2.60 – 3.39	Moderate
1.80 – 2.59	Low
1.00 – 1.79	Very Low

Moreover, to establish an accurate measurement of the level of instructor's competence as perceived by the college faculty members who were handling science education subjects in every indicators, the rating scale were adopted.

Point Value	**Descriptive Equivalent (DE)**
4.20 – 5.00	Very High
3.40 – 4.19	High
2.60 – 3.39	Moderate
1.80 – 2.59	Low
1.00 – 1.79	Very Low

To answer problem number 3 on the significant difference on the instructor's competence in terms of the program where they belong as variable, Analysis of Variance (ANOVA) was used.

Lastly, to treat the data determining the significance of the relationship between variables – triarchic intelligences and instructor's competence, the Pearson Product Moment Correlation was employed by the researcher.

Ethical Consideration

According to Zukauskas et al. (2018) social responsibility's ethical principles and research ethics are strongly intertwined. This study kiiks at dealing with individuals in a variety setting. The researchers raised a task to gain confidence to ensure transparency, acquire the responsibility establish best relationship and collect trustworthy data.

Autonomy. Before the study started, the researchers sought the participants informed consent from and made clear the purpose of the research obtained informed agreement and approval from the participants before conducting the research process. The researchers clarified the purpose of the research and gained a consent form. And made clear the purpose of the research.

Confidentiality. The respondents received assurance from researchers or participants that they would keep the results. Participants' will be safeguarded by the researchers, Therefore, the information, findings, and obtained data will be kept and protected

Anonymity. The researchers guaranteed the anonymity of the respondents' or participants' privacy while conducting the study. The participants' identities were kept confidential and they were permitted to leave the study if they feel uncomfortable while the study was being conducted. Therefore, the gathered information and data will be saved privately and protected.

III-Results and Discussion

This section dealt with the presentation, analyses, and interpretation of data about the specific problems of the study. To begin discussing the study results, it is first essential to address the research questions being asked by the researcher.

Triarchic Intelligences

Depicted in Table 1 is the level of triarchic intelligences. The descriptive analysis shows that the level of the instructors triarchic intelligences is very high. The data divulge that ability of the faculty in analytical, creative and practical aspects were observed at all times.

The table also reveals that practical intelligences got the highest mean. The data signify that teacher's acquired practical dealings on their everyday living whatever the means. They have their learning in real life settings because the more they use their knowledge, the more the gain practical insights, echoing the idea of Baum, Bird, and Signh (2011).

The result further means that students should have the courage to use their idea gained inside the classroom. As stated by Sternberg et.al. (2007), classrooms should not create a gap between real life and book learning. Lessons learned from books should find an implementation in the field work, workshop, laboratories, and playground. There must be a maximum opportunity given to work in simulated settings which would provide hands-on experience and more practical wisdom.

On the other hand, analytic intelligence got the lowest mean. The instructors demonstrated their abilities for problem-solving, academic performance, information, processing and the use of abstract reasoning. This means that understanding science courses content dealing with scientific process and information are embedded among the lives of the faculty.

Lastly, the triarchic intelligences emphasize its concept that all instructors need to learn more on problem-solving cycle by identifying the problem, need to allocate resources for solving the problem, formulate strategy, monitor and need to evaluate their solving method. In the same manner, the said intelligences are not only for memory but also for the analytical, creativity and practical process that improve quality instruction and outcomes.

Table 1. *Level of Triarchic Intelligences*

Indicators	Mean	Descriptive Meaning
Analytical	4.21	Very High
Creative	4.23	Very High
Practical	4.57	Very High
Overall Mean	4.34	Very High

Instructors Competence

Reflected in Table 2 is the level of instructor's competence. The descriptive analysis shows that the level of the instructor's competence is very high. The data implied that there is an excellent apprehension towards teachers in terms of making themselves be known with methodologies, course content and so with strategies. Also, needs to embrace with desirable traits and characteristics.

The table also emphasizes that professional characteristics or traits got the highest mean. The data signify that teacher's manifested some personal features like skills in communicating, listening, collaborating, adapting and more. The engagements in classroom presence, valuing real-world and exchanging best practices are some and form parts of a lifelong learning among faculty in the college.

Instructors' competence manifested during the implementation of classroom management, the use of pedagogies. It resulted into skills in exhibiting desirable characteristics that enhance skills of students. As emphasize by Siddiqui (2009) that the integration of knowledge, planning preparation, teaching abilities and understanding lesson content may be known as factor of recognizing their competence.

In the context of teaching, instructors must be skillfull on the use of teaching aids as technology in teaching. This implies that the teacher should will have its most bearing in their field if and when they are accompanied with innovations and improvements in teaching. This suggest that the adoption of planning and designing lesson plan is indeed necessary.

Table 2. *Level of Instructors Competence*

Indicators	Mean	Descriptive Meaning
Know of the Subject Matter	4.72	Very High
Teaching Strategies and Methodologies	4.62	Very High
Classroom Management	4.59	Very High
Professional Characteristics/ Traits	4.78	Very High
Overall Mean	4.68	Very High

Test of Difference on the Instructors Competence

Projected in Table 3 is the test of significant difference on the instructor's competence in terms of programs. To determine significant difference on the competence of instructors when classified according to program, the researcher used Analysis of Variance (ANOVA) at 0.05 level of significance.

Results emphasized that there is a 0.93 of f-value and 0.569 p-value. This means that null hypothesis is accepted. It implies that the competence of the instructors across 4 programs in college did not vary. Faculty members in the college have manifested knowledge, pedagogical skills, management and traits towards work is in similar norm.

Table 3. *Test of Difference on the Instructors Competence in terms of Program*

Variables	f-value	p-value	Decision
Program (BSOA, BPA, BSAB BTVTED,)	0.93	0.569	H_0 Accepted

Relationship between Triarchic Intelligences and Instructors Competence

Indicated in Table 4 is the test of significant relationship between triarchic intelligences and instructor's competence of Santo Tomas College of Agriculture Science and Technology. To determine significant relationship between variables, the researcher used the Pearson Product Moment Correlation.

Figures reveal that there is a 0.537 of r-value and 0.012 p-value. This means that null hypothesis is rejected. It implies that the triarchic intelligence and instructor's competence manifested a relationship. The competence of college faculty handling science related courses is affected by its capacity either in an analytic, creative or practical perspective.

Table 4. *Test of Relationship between Triarchic Intelligences and Instructors Competence*

Variables	r-value	p-value	Decision
Triarchic Intelligences	0.537		
Instructors Competence		0.012	H_0 Rejected

IV-Conclusions and Recommendation

Conclusions

The following conclusions were drawn based on the findings of the study:

1. The triarchic intelligences of college instructors is very high.
2. The instructor's competence of the college is very high.
3. There is no significant difference on the instructor's competence along with programs.
4. There is significant relationship between triarchic intelligences and instructor's competence.

Recommendation

The study offers the following recommendations

1. The triarchic intelligences of college instructors must be maintained.
2. Provide additional academic related college activities that could enhance analytical,

creativity and practical perspective of instructors.

3. The instructor's competence of the college must be maintained. This means that the

instructors must be given opportunity to attend gatherings/fora/Conferences that enriches his/her knowledge of the subject matter, teaching strategies and methodologies/classroom management/ and professional traits.

4. In order to ensure the competence of instructors in the landscape of science education

through designing instructional model that enhances analytical, creativity and practical competence of instructors are highlighted.

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