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The Possibility of Integrating Exotic Animals into Philippine K-12 Science- Getting Immediate Reaction from Stakeholders

[1]Bryan Yves G. Araneta, [2]Gloria G. Araneta

[1] College of Education Iloilo State College of Fisheries-Main, Tiwi, Barotac Nuevo, Iloilo, Philippines
[2] Teacher Education Department Northern Iloilo Polytechnic State College- Concepcion Campus, Concepcion, Iloilo, Philippines

Abstract: **Exotic animals become increasingly popular in the Philippines. Some educators suggested that it offers a variety of opportunities for learning science. Relevant information was obtained from the immediate reaction of high school students, science teachers, school principals, parents, and exotic pet hobbyists. Numerous thematic insights emerged from individual interviews and focused group discussions. Generally, Science teachers, school principals, and exotic pet hobbyists are positive towards extending the fun and benefits exotic animals can bring into the classroom. Most parents and some students, however are doubtful about it and brought up various complications like fear, ethical and legal issues. Hobbyists and science teachers nonetheless, offered ways to convince them. This study was able to establish that integrating exotic animals into Philippine K-12 Science is possible as long as they are well understood by skeptical stakeholders.**

Keywords: **exotic animal, K-12 Science, ethics, phenomenology, education.**

I. INTRODUCTION

There is scarcity (or none at all) of the literature on exotic pets being utilized as learning objects in high school science education. The term exotic animal can be ambiguous as it can include in its criteria large animals and the endangered species. In this study, however, exotic animals are limited to relatively small, easily-handled animals like tarantulas, scorpions, geckos, non-venomous snakes, tropical fishes and marine invertebrates. These are reared by a few enthusiasts who call themselves exotic pet hobbyists. In the Philippines, it is already becoming popular. Exposing students to commonly available animals like frogs, earthworms, and flies in their life science investigations can lead to lifeless stereotyping of biological processes that may prevent holistic learning. With the newly introduced K-12 Curriculum in the Philippines, education stakeholders should also expect new perspectives and revolutionary strategies in delivering science education. The increasing number of those exotic animals, including the knowledge to take care of them is already an answer to this need. Educators only need to open their minds to embrace something new, something unique, and most probably something controversial.

The most obvious issue with using exotic animals in education is the perceived harm they might bring to the learners as well as to the animals themselves. Animal rights activists may react negatively to it. Also, there might be insufficient sources to cater the needs of a large population of students. There is a need to get direct insights from education stakeholders to get clarified with all the possible concerns that will determine the possibility of integrating exotic pets into K-12 science. Since exotic animal rearing and science education are not yet fused in literature, it is imperative that information is gathered first hand using grounded data. It is in this light that this study was conducted.

II. METHODOLOGY

This study was done in the context of the Constructionist epistemology. Before getting insights from the stakeholders, it is already expected that we get multiple, even contradictory but equally valid insights on the possibility of integrating exotic animals into Philippine K-12 science education as the participants of this study think and reacts in different ways. The researcher blended interpretivist approaches such as heuristic analysis and phenomenology to guide the analysis. All participants were chosen purposively. A focused group discussion (FGD) was participated by two science teachers, a female parent who is a chemical engineer, a male parent who is a PUJ Driver, and an exotic pet hobbyist who is an IT Specialist. The researcher, who is in addition, a science teacher, also participated in the said FGD; thus there are 6 individuals who participated in the FGD. Individual interviews were taken from three Grade 7, two Grade 8 students, and two school principals; one of them is also a licensed Guidance Counselor. Due to the complexity of data from transcripts, a graphical summary of insight analysis was constructed to create a comprehensive picture of what is going on in this study.

III. RESULTS

Parents are natural protective beings, and they immediately reacted with a big NO on allowing their children to handle scorpions, tarantulas, and snakes. They point to obvious dangers like bites, venoms, stings, and adverse psychological effects. They believe that it is somewhat unnecessary to expose their children to these so-called exotic animals as there is a variety of alternatives that are safer and more practical. In addition to this, they also suspect about the possibility of high costs of purchasing these organisms. The Department of Environment and Natural Resources (DENR) may also have strict rules on the possession of these organisms. They don't want to risk their children running against the legal issues that may arise from exotic animal handling and experimentation.

Grade 7 and Grade 8 students, on the other hand, are more of the "curious type" during the interview. They also express their fear on the handling of these organisms, but they are willing to take risks. After all, it is an interesting idea to try studying unique animals. They are also willing to venture into exotic pet hobby and they are quite confident that they can convince their parents on this. Students can imagine themselves having a great time learning life science not only with commonly used animals but also with utilizing exotic species. As long as there is somebody who will guide them on how to handle and take good care of these organisms, they will not hesitate in trying something new.

The school principals just like the parents are more concerned about the safety of the students, but they are also open to learning more about the possibility of integrating these exotic animals in science classes. One of them stressed out the importance of training the teachers who want to try this new strategy. Fear, according to her is a normal reaction against something as radical as it is always expected to fail or create adverse effects. People already have preconceived knowledge of animals that bite or stings or cause allergic reactions, etc. All they need is a sort of "fear therapy" by convincing them via practical means that using a variety of animals for science education is not hazardous at all given that precautionary measures are observed. The school principals believe that, if this new technique or strategy is feasible by all known standards, it will find its way towards being integrated into the new K-12 Science Curriculum.

Figure 1. The Various Thematic Issues and Reactions Surrounding the Possibility of Integrating Exotic Animals into K-12 Science

Science teachers are enthusiastic about the issue. They have already discussed the various possibilities where exotic animals can be used in teaching life science. Starting with as early as Grade 3, these can be used when students try to differentiate between terrestrial and aquatic animals. For example, they can point out to a variety of structures in every representative organism that makes them suitable in their natural environments. Species interactions can also be simulated such as predation, commensalism, and mutualism. The reproductive cycles can also be studied by grades 5 and up. Conservation topics can also be learned using exotic animals by breeding some rare, economically and environmentally important species. Moreover, the process of decomposition, Mendelian Genetics and even crude DNA extraction can also be done using these animals. A variety of animal physiology activities such as respiration, nutrition, and circulation is also possible. More or less, science teachers recommend the integration of using exotic animals in K-12 education. They also suggested that schools have a mini nursery where these animals are kept and taken care of. They are positive that with proper training and research, they can systematize this pedagogical strategy by creating training manuals and standard protocols with the help of exotic pet owners themselves. They also believe that they can convince the parents about this.

On the point of view of an exotic pet owner and enthusiast, he is more concerned about the welfare of the animals in the hands of inexperienced students or teachers. For example, in the case of scorpions, if they are left on the table and they fall off, their exoskeletons will break, and they will die. Some animals also live on special diets that must be religiously followed. Once an exotic animal gets lost, it is unlikely that it will survive. He also shared his experience of fear when he first handled a tarantula. It bit him on their first meeting. In his 3 years of rearing exotic pets, he was bitten only twice, by a tarantula and. He is confident that handling any seemingly dangerous animal is safe as long as you are knowledgeable of its behavior and instincts. This is why proper training and education is a must. He is happy to hear that students are willing to learn science using exotic animals. He said that it should be the children who must educate their parents. He believes that this interest on the part of the students will greatly facilitate their learning. He thus also recommends the use of exotic animals in schools. About the issue of legality, he explains that it is easy to secure a permit from the Department of Environment and Natural Resources on a per species basis. He also suggested getting permits from animal rights groups or attends training and workshops from organizations that are well-versed in the ethical issues surrounding the active use of live animals for education. If there is a will there is a way. It's up to the school administrators, teachers or DepEd educators to evaluate whether a particular technology or strategy in education can be implemented on a full-scale basis. They can also do experimental classes to test whether it is really feasible to rear animals and use them in K-12 science. Every Life Science teacher should not have a hard time learning and handling animals for education. Exotic pet enthusiasts within the community can give them preliminary training and then they can proceed by themselves after they are equipped with the basics. The term exotic animal can be used for practical purposes like in a research study, but it must be redefined later or given a more appropriate term if possible. It is also important to note that there are plenty of exotic species that are reared by aquarium enthusiasts such as flatworms, shrimps, sponges, gastropods, sea urchins, sea cucumbers, and even corrals. These too can also be utilized for education.

IV. DISCUSSION

The negative reaction of parents that their children can be harmed by exotic animals is a major barrier in the consideration of its use in K-12 science education, especially in the biological sciences. Obeying the law and keeping their child safe become mutually exclusive (Rotondo, 1995). This is the reason why they are concerned about the legalities and ethical issues that may arise. Much information remains unknown about how parents decide to be involved in their children's education, however, parents may take a more community-centric view that includes keeping their children safe and getting them to school (Anderson and Minke, 2007). Hoover-Dempsey and Sandier (1995, 1997), proposed a relatively parsimonious process variable model that link parents' initial decisions to become involved in their children's education. According to the model, parents make an initial decision to be involved in their children's education according to their beliefs and the general opportunities and demands for involvement with the school and their children. From their immediate reaction to the issue, it is obvious that their fear comes from their internal belief systems. However, if the school and their children demand something contradictory, such as encouraging the use of exotic animals, parents might change their minds so that their involvement will never be perceived as negative. Students confirm this by being confident that they can convince their parents when the need arises. Bandura's (1997) theory of self-efficacy can explain parents'

beliefs that their involvement in their children's schooling will positively affect their children's learning and school success. Parents with a high sense of efficacy believe that they can enact the behaviors that will result in these positive outcomes. If science teachers, exotic pet owners, and school administrators are unanimous in their recommendation for the integration of exotic animals in science education, parents generally will support it too.

In a relatively old research paper (Tamir and Sever, 1980) on "student's attitude towards the use of animals in Biology teaching," students' responses reveal a high level of personal involvement regarding different aspects related to the use of live animals in school. This attitude stems from the great interest most children have in animals, as well as from personal relationships; children have developed with farm animals and pets. In spite of all the reservations, most students clearly favor using live animals as part of their studies in school and view their experiences with animals as a means for increasing their motivation as well as their efficiency in learning and retention. Student interest is one such relevant behavior mentioned by the interviewed science teachers. Considered as a motivational factor, interest has an important influence on self-regulated learning (Krapp, 1999). Zimmerman and Schunk (2001) defined self-regulated learning as learning that results from students' self-generated thoughts and behaviors that are systematically oriented toward the attainment of their learning goals. Self-regulated students are those who are metacognitively, motivational and behaviourally active participants in their own learning process (Zimmerman, 2001). This general student attitude, combined with some unique outcomes resulting from animal studies can greatly enhance the learning of science. We cannot neglect the fact that science teachers in this study have already conceived a variety of ideas where exotic animals can be utilized in the teaching of K-12 life science concepts. This sort of complementary relationship strongly supports the use of animals in schools.

School administrators who have an ongoing management responsibility for both the teachers and students have an obvious choice to take the lead in family-school partnership (Walker et.al., 2010). The school principals suggested that a dialogue between all the stakeholders involved in K-12 education is a must if there is a need to properly deliberate the issue. School success is a central outcome of the complex processes that influence child development. Such processes occur within and among three key environments: school, neighbourhood, and family (Richman, Bowen, & Woolley, 2004). The life science teachers, administrators, and students should work together to maintain healthy dynamics upon introduction of a new pedagogical approach such as utilizing a variety of exotic animals in education. The K-12 science curriculum must be implemented well by the school. Not until both the teachers and the students agree on how learning life sciences can be efficiently carried out, we cannot validate the education enterprise. The neighbourhood can be represented by the exotic animal owners and enthusiasts themselves who also have a pool of networks and resources they can utilize to support the possible integration. They are an informal educational system specialized in exotic animal rearing and breeding. Merging their environment with that of a school can offer greater possibilities and opportunities. How much more if another socially-integrated environment that is the family adds more to this? If we consider the contextualist perspective by Goldhaber (2000), it would be interesting to note the physical and social factors as well as their interactions as playing key roles in the integration process. Bronfenbrenner (1986) on the other hand was able to establish the multilevel environmental contexts that can regulate developmental outcomes such as the spiral learning of science in a K-12 system. Microsystems whether it's in a lecture room or a laboratory greatly influences a child. It provides direct and immediate sensory stimuli that will create a unique experience in a student's consciousness. Thus, a classroom teeming with a variety of life forms can have a profound effect on a student. Mesosystems connects the Microsystems. Mesosystems can include family culture in all its complications such as the established strategies employed when deliberating educational issues or the relationships between the family, school, and exotic animal owners or organizations. It is clear amidst these complexities that using exotic animals in the K-12 science curriculum is possible.

V. CONCLUSIONS AND RECOMMENDATIONS

The K-12 Science curriculum in the Philippines must introduce new approaches that will actively involve both students and teachers in the classroom. The use of a variety of these so-called exotic animals poses a great potential for this purpose. There are a few areas in the integration, however, that needs fixing. It is greatly recommended that stakeholders most especially teachers and curriculum experts deliberate further on this. Unless this integration is not realized at least in experimental settings, all we can achieve are mere speculations and lost time.

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