



What do they think of Agriculture and Fishery Careers?

The Perception of Grade-9 Students

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Abstract

This study determined whether the intervention of exposing Grade-9 students to agri-fishery career opportunities and technologies could change their perception on agriculture and fisheries. Eighty-eight (88) student-respondents from public and private high schools who participated in the three-day Agri-Fish Camp received first-hand experience in agriculture and fisheries through various related university projects and technologies. It also included lectures, games, activities, training and visits to agricultural centers. Along with the intervention, a comparison between the pre-test and the post-test showed a significant change in their perception. Respondents believed that agriculture and fisheries were a major aspect of the community. After the intervention, they were convinced that agri-fishery career paths would bring them out of poverty and a brighter future for their families. They also have a strong agreement on the involvement and use of high technology in agriculture and fisheries. Future recommendations include strengthening career guidance programs, developing strategic plans and school intervention programs.

Keywords: Agri-Fishery Perception, Junior High School, Agri-Fish Camp

Introduction

Much of today's youth are not inclined to choose agriculture and agriculture-related courses as options for their career path. Consequently, this translates to the steady decline of enrollment in these specializations, according to reports from the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (Padin, 2015). This is despite the increasing demand for food and other farm products in the Philippines. This downward trend may pose a serious concern to the agricultural sector, which is responsible for supporting the country's growing demand for food, fuel, and feeds. The Commission on Higher Education (CHED) reported a nearly 50 percent decline of enrolment in agriculture, fisheries, and forestry, and veterinary medicine in just 10 years from the academic year 1999-2000 to 2010-2011 (Clemente, 2014). With this reality, fostering the youth's interest to Agriculture and Fishery is the first step in reversing this trend.

Farming was never perceived as a lucrative form of livelihood and agricultural courses were often equated to farming. For the ambitious and idealistic youth, it is not the means to get out of destitution (Sibayan, 2016). In a study conducted by Simon, Claravall, & Simon (2013) about the perceptions of students on Agriculture programs, they found out that the number one reason for the decreasing number of enrollees in the agriculture programs is that the students do not want to work in the farm anymore. This (mis)conception could also be attributed to the students' limited contact with agriculture and little or no agriculture education resulting in a lack of an agricultural knowledge base. Students instead learn about agriculture through secondary and tertiary sources, such as television, books, and the internet (Ruth, Lundy, & Park, 2005).



Higher education institutions in the Philippines are facing problems enticing students to take agriculture-related courses due to a number of reasons: “(a) there are more job orders than permanent employment opportunities in the agriculture, fisheries and natural resources agencies; (b) students have more lucrative opportunities in the most subscribed courses now in other countries; (c) Filipino youth of today look at farming as inferior source of living despite the fact that Philippines needs a large number of agricultural technicians and scientists, fisheries technologists and environmentalists who are experts to influence productivity of the local farmers; (d) most of parents are economically marginalized who do not even own a family-sized farmlands for the family members to supposedly manage; (e) in the recently concluded similar study conducted in Luzon area reveals that even (Agriculture Fisheries and Natural Resources) AFNR professionals now discourage their children to enroll the same; (f) some scholarship grants of politicians are politicized, and lastly; (g) political will is thinly evident to provide “options and opportunities” to answer the requirements of economic viability, livelihoods and wellbeing, ecosystem stewardship, rights and access, food security and food sovereignty, governance and governability, and assessment and monitoring” (Clemente, 2014).

In addition to the problems in enticing students to take agriculture-related courses, the aging population of farmers and decreasing arable land area have drastically affected the future of the Philippines. Thus, it is high time that efforts should be made to encourage the youth to engage in the agricultural industry and change their perspective about agriculture.

As mentioned by Burris (2013) in her thesis about determining the agricultural perceptions of high school students for the “I Love Farmers...They Feed My Soul!” organization in California, the “survival of this vital industry depends on educating and encouraging the next generation of decision-makers”. She also suggested that high school students should be the key target and focus of the educational efforts regarding agriculture because, as the next generation of consumers, the future political and social decisions of these students will have the power to change the agricultural industry (Burris, 2013). Relating this concept to the current problems happening in our country, the youth can potentially contribute to the Philippine agriculture.

Furthermore, Matthews & Falvey (1999) stated that increasing high school students’ agricultural awareness about all aspects of agriculture and agricultural careers in education may influence their perceptions towards agriculture in the long term. It was in this light that this study was undertaken.

Objectives of the Study

The objective of this study was to determine if the intervention of exposing the respondents to agriculture and fishery career opportunities and technologies could change their perception toward agriculture and fishery. It aimed to compare the perception of the respondents toward agriculture and fishery before and after the intervention.

Hypothesis

HO: The exposure of respondents to agriculture and fishery career opportunities and technologies would not change their perception toward agriculture and fishery.

Methods and Materials

The study was anchored on Activity Theory, a psychological meta-theory, paradigm, or framework about studying, thoughts, and consciousness (Portnov-Neeman & Barak, 2013). The origins of activity theory lay in Vygotsky’s cultural-historical psychology that sought to understand human activities as complex, socially situated phenomena.



In this study, the thoughts and consciousness of the respondents towards agriculture and fishery was the major focus. The concept was to determine if there would be changes in their perception upon implementation of the intervention. The intervention in this study was a three-day Agri-Fish Camp, a camping activity in which respondents were given first-hand agriculture and fisheries experiences through the different agri-fishery projects of the university. Lectures, games, activities and trainings were also provided to the respondents including career counselling and guidance, entrepreneurship and basic organizational skills.

They visited various university and partner agencies' technology centers and were introduced to different agri-fishery technologies. Also, they participated in orientations and hands-on demonstrations on different activities promoted by each agency/center. They learned about (a) aquaculture and fisheries research and development; (b) small and large ruminants technology development and production; (c) agro-industrialization technology development; (d) tropical mushroom production and processing; (e) goat and sheep industry; (f) hydroponics and aquaponics; (g) postharvest development and mechanization; and (h) marketing of agricultural products and technology.

To gather the perception of the respondents, pretest before intervention and post-test after the intervention were conducted. For the pretest, the schools were personally visited by the research team. To determine the respondents of this study, Grade 9 students were gathered for a brief orientation and were asked to answer a survey questionnaire about their perception toward agriculture and fishery. The questionnaire survey was administered through the assistance of the teachers. After the encoding of their responses, Grade 9 students with the lowest mean scores were selected to become respondents and participants of the intervention program. Using the same instrument, the post-test was administered on the last day of the intervention.

Research Design

This study utilized the one group pretest and posttest design other known as the pre-experimental research design. It is a research design in which the same assessment measures are given to participants both before and after they have received treatment or been exposed to a condition, with such measures used to determine if any changes could be attributed to the treatment or condition (American Psychological Association (APA), n.d.).



Figure 1 Research Design of the Study

As shown in Figure 1, O_1 represents the initial perception of the respondents during the pretest, while X represents the implementation of the intervention. O_2 represents the post perception of the respondents after the intervention.



Respondents of the Study

The respondents of the study were eighty-eight (88) Grade 9 students who were identified through their mean scores in the Agri-Fishery Perception Inventory (AFPI). They were the ones with the lowest mean scores obtained from their answers to the questionnaire. The participating schools from which they came were identified by each schools division office in the province of Nueva Ecija.

Most of the respondents were fourteen years old (67.05%), female (61.36%), second-born children (32.95%), and with two siblings (32.95%) in the family. Most of them lived in rural communities (70.45%) in the province of Nueva Ecija, with their parents still living together (84.09%) in their own house (86.36%). Moreover, most of the respondents had no experience in farming (52.27%), only 13.64 percent had agriculture-related trades as other sources of family income, while 53.41 percent had a farm.

Despite the locale of the study is an agricultural province and that farming is the main source of living among people, most of the respondents are not yet exposed to the agricultural industry since a majority of them do not have any experience in farming. While the majority of respondents are living in rural areas, it does not assure that they are familiar with the nature of agriculture and fishery activities in their place.

Research Instrument

A two-part researcher-made questionnaire-checklist was the main instrument used for gathering the data of the study. Part 1 dealt with the socio-demographic characteristics of the respondents of the study. It included their age, sex, birth order, number of siblings, classification of address, type of residence, marital status of parents, and ambition in life.

Part II was the Agri-Fishery Perception Inventory (AFPI) composed of 20 items that denote the level of perception or awareness as regards agriculture and fisheries as a career. It was rated as 4 – strongly agree; 3 – agree; 2 – disagree; and 1 – strongly disagree.

Reliability of the Instrument

To test the reliability of the research instrument, the internal consistency method was utilized using the Cronbach's alpha and was computed using the Statistical Package for Social Sciences (SPSS). It is a measure of internal consistency; that is, how closely related a set of items are as a group. A "high" value of alpha is often used as evidence that the items measure an underlying construct.

A pilot test was conducted, and the Agri-Fishery Perception Inventory had a coefficient value of 0.92, suggesting that the items have relatively high internal consistency.

Apart from getting the coefficient value, the instrument was also validated by a one (1) social scientist and one (1) expert in the field of agriculture and fisheries. Some of the items were revised based on their suggestions and recommendations.

Data Analysis

The researchers used the frequency count and percentage to treat the data covering the socio-demographic profile of the respondents. The weighted mean was utilized to indicate the extent of perception as regards agriculture and fishery.

A t-test was used to determine the significant difference between pre-test and post-test results. All computations were done using the Statistical Package for Social Sciences (SPSS) version 21.



Results

Perceptions on Agriculture and Fishery

Findings on respondents' perception of agriculture and fisheries indicated that for the pretest, they agreed that agriculture and fisheries offer many opportunities for those who embrace it as their careers ($\bar{x} = 2.99$, $SD = 0.91$). Respondents strongly agreed on the part played by agri-fishery in peoples' daily lives ($\bar{x} = 3.31$, $SD = 0.77$), as well as its importance to the community ($\bar{x} = 3.61$, $SD = 0.84$). They also strongly agreed that this field belongs to both men and women" ($\bar{x} = 3.34$, $SD = 0.60$).

While the participants disagreed with the statement "agriculture and fisheries involve dirty works" ($\bar{x} = 2.49$, $SD = 0.99$), this could possibly mean that the respondents did not have a clear understanding of the activities and works of an agriculturist or a fisheries technician prior to the intervention. Following their participation in the various activities undertaken during the intervention, they realized that agriculture and fisheries require some authentic and experiential activities involving dirty works. For instance, they experienced the cultivation of agricultural soils, the preparation of compost for the research and cultivation of mushrooms and the processing of vermicompost for the conversion of organic waste.

Table 1 Respondents Perception on Agri-Fishery

Statements	PRE-TEST			POST-TEST		
	Mean	SD	Description	Mean	SD	Description
<i>Agriculture and Fisheries...</i>						
are part of peoples' daily life	3.31	0.77	Strongly Agree	3.86	0.68	Strongly Agree
are important to the community	3.61	0.84	Strongly Agree	3.84	0.78	Strongly Agree
offer many job opportunities to graduates	3.17	0.87	Agree	3.66	0.87	Strongly Agree
are exciting topics to discuss about	2.90	0.89	Agree	3.34	0.71	Strongly Agree
involved the use of high technology	3.00	0.93	Agree	3.50	0.86	Strongly Agree
are interesting field of specialization	2.69	0.93	Agree	3.49	0.75	Strongly Agree
are viable career option	2.95	1.01	Agree	3.43	0.9	Strongly Agree
involve dirty works	2.49	0.99	Disagree	2.65	0.93	Agree
involve farming and fishing only	2.40	0.78	Disagree	2.25	0.86	Disagree
are okay for both for men and women	3.34	0.60	Strongly Agree	3.62	0.56	Strongly Agree
require physical strength	3.24	0.77	Agree	3.19	0.72	Agree
are long term businesses	3.07	0.87	Agree	3.50	0.77	Strongly Agree
will give a bright future for the family	3.17	0.77	Agree	3.72	0.84	Strongly Agree
are lucrative careers	2.38	0.86	Disagree	2.70	0.77	Agree
are good ways out of poverty	2.81	0.87	Agree	3.32	0.85	Strongly Agree
are hands-on learning	3.11	0.82	Agree	3.51	0.76	Strongly Agree
will help improve relationship with other people	3.10	0.89	Agree	3.68	0.69	Strongly Agree
will develop leadership skills	3.14	1.04	Agree	3.64	0.80	Strongly Agree
offer entrepreneurial opportunities	3.16	0.81	Agree	3.67	0.89	Strongly Agree
are jobs of older men and women	2.72	1.01	Agree	2.77	0.74	Agree
Overall Mean	2.99	0.91	Agree	3.37	0.82	Strongly Agree

Legend: 1.00 – 1.75 Strongly Disagree 2.51 – 3.25 Agree
 1.76 – 2.50 Disagree 3.26 – 4.00 Strongly Agree

Agriculture and fisheries, being profit-making careers was initially perceived to be the lowest among respondents ($\bar{x} = 2.38$, $SD = 0.86$). This implies that most of them did not see agriculture and fisheries as a career that pays well or creates wealth rather than as a low-wage labor. However, this perception was changed after the intervention ($\bar{x} = 2.70$, $SD = 0.77$). They were enlightened that agri-fishery could also be a potential source of good income and stable, well-paid careers.

Respondents' perceptions changed after they had been subjected to the three-day Agri-Camp. Their ideas about what the agri-fish was all about were changed by the different activities they had experienced during the camp. Their visitation to the multi-purpose center and participation to activities on the marketing of agricultural products increased their perception that agriculture and fisheries offer entrepreneurial opportunities.

After the intervention, the respondents strongly agreed ($\bar{x} = 3.37$, $SD = 0.82$) on the many great opportunities that agriculture and fisheries may bring. Consistently, the respondents perceived that agriculture and fisheries do not only involve farming and fishing ($\bar{x} = 2.25$, $SD = 0.86$). After their exposure to technological and research facilities, they realized that agriculturists and fishery technologists were also doing research and laboratory works. This strengthened their conception that agri-fishery courses could produce scientists, researchers and industrialists, making them aware that other career opportunities may stem out from this career/specialization.

Test of Difference of the Pretest and Post Test on the Respondents' Perception of Agriculture and Fishery

Table 2 shows the result of the computed paired sample t-test. This was done to determine whether the mean of AFPI post-test significantly differs from the mean AFPI pretest.

Table 2 Pre-Test and Post-Test of the Respondents' Perception about Agriculture and Fisheries

	n	Mean	SD	Mean Difference	t	p-value
AFPI Pre-Test	88	2.988	0.334	-0.377	-9.241*	0.000
AFPI Post-Test		3.365	0.273			

Legend: *Significant ($p < 0.01$)

Results show that the mean of AFPI Post-test ($\bar{x} = 3.365$, $SD = 0.273$) is significantly higher than the mean AFPI Pretest ($\bar{x} = 2.988$, $SD = 0.334$), $t(87) = -9.241$, $p < 0.01$. It implies that a significant change on perception of the respondents happened when they were exposed to first-hand agriculture and fisheries experiences during the intervention. Furthermore, the results reveal that lectures, games and trainings provided to the respondents including career counselling and guidance, entrepreneurship and basic organizational skills were effective in transforming their perception towards the agri-fishery careers. Thus, the null hypothesis, which states that the exposure of respondents to agricultural and fishery career opportunities and technologies would not change their perception of agriculture and fisheries, is rejected.

Discussion

The three-day intervention created an avenue for the respondents to be exposed on the different career opportunities in agriculture and fisheries by experiencing hands-on activities provided by various agri-fishery agencies in the university. Based on the results discussed in the previous section, students' perception of agriculture and fisheries has changed positively.



Career Opportunities

Respondents believed that agriculture and fisheries were a key part of the community. After the intervention, they were convinced that career paths related to agri-fishery will get them out of poverty and will bring a brighter future for their family. This supported the claim of several researches which indicated that some young Filipino people still have high regard for agriculture (Gaboy et al., 2019; Manalo & Van de Fliert, 2013; Hettige, 2005; Punch & Sugden, 2013). Agriculture and fishery careers were still regarded as decent vocation that could provide entrepreneurial opportunities and viable source of income (Gaboy et al., 2019). The presentation of different marketing strategies and agri-preneurial activities during center visitations convinced the respondents that long-term enterprises could also be generated in the field of agriculture and fisheries. As they learned about the connections between agriculture and careers, their perspectives about agricultural careers were positively changed (Frazee et al., 2011).

This result was also supported by the study of Settle et al. (2012). On their research about self-efficacy and career interests of students who participated in a one-week agricultural communications camp, they concluded that students who participated in a pre-college camp had an increase in self-efficacy and career interest in agriculture. This supports the idea of intervention programs to strengthen the perception of students towards agriculture and fisheries. They also suggested that to optimize effectiveness, agricultural pre-college programs should consider shifting focus to students with non-agricultural backgrounds. In a study conducted by Duncan & Broyles (2004), high school juniors and seniors who participated in a four-week Governor's School for Agriculture in Virginia, U.S.A. found that participants had an increased level of agricultural literacy after the program. Baker, Irani, & Abrams (2011) also found similar results in their research. They reported that students' negative perceptions of horticulture (agricultural industry which focused on the production and use of plants for food, comfort, and beautification) as a career path shifted once they were introduced to many of the available career opportunities.

Learning Opportunities

The respondents' perception of agriculture and fishery has changed when the intervention was employed. Hands-on activities and visitation to various centers, as part of the intervention, had provided familiarity and understanding of the nature of agri-fishery and played crucial part in increasing their positive perception about the field. Awareness campaigns such as lectures, seminars, fora, and visitations to agri-fishery centers when turned into a pleasant experience could change the young people's perception of the difficulty in engaging in agri-fishery activities.

As reflected in the results of this study, agriculture and fisheries, as perceived by the respondents, were considered as an interesting field of specialization which provide exciting topics to discuss about. After the intervention, the respondents learned that there were innovative ideas in agriculture and fisheries that proved to be useful and meaningful in the community. They have learned landless farming using the hydroponics and aquaponics systems and have experienced various processes in the cultivation and production of mushrooms.

Another key finding of this study was the strong agreement of respondents on the involvement and use of high technology in agriculture and fisheries. After the intervention, they learned about the different technologies used in the cultivation and production of agricultural products. For instance, their visitation to farm mechanization center educated them about modern rice milling machines, household applications of biomass energy, and smart-farming.

These new hands-on learning experiences have positively affected their perception of agri-fishery activities. As emphasized by Chan et al. (2020), activities that elicit active engagement will create more meaningful learning



opportunities and experiences among the students. This emphasizes the importance and impact of promotional activities related to agriculture.

Agricultural Engagement Programs

As mentioned by Smith-Hollins (2009), there are several barriers that serve as reasons why students do not enroll in colleges of agriculture. The top three barriers he identified were: “lack of discussion from high school guidance counselors, lack of contact with recruiters in agriculture, and lack of promotional materials about agriculture”. Through the intervention program promoting agriculture and fishery, more students will be encouraged to enroll in agricultural programs. Moreover, Frazee et al. (2011) suggested that information and communications technology (ICT) and communication events and workshops should be presented to high school students in order to provide them “with new perspectives about agricultural careers beyond traditional production-related views”. Also, the operation and use of technology would be helpful in supporting the students and making them more engaged and active during the intervention (Mercado & Ibarra, 2019).

As supported by Baker, Irani, & Abrams (2011), creating programs and activities for the students to explore and experience the career opportunities in agriculture will positively affect their perception and interest in taking career paths. These programs could also include other people in the community. As suggested by Smith-Hollins (2009), those “concerned with increasing enrollment and stabilizing enrollment in colleges of agriculture should educate parents, other family members and friends of potential students about the benefits of involvement in agriculture”. As reflected in the study of Manalo & Van de Fliert (2013), parents did not encourage their children to be involved in agriculture, specifically farming. This could be resolved if community members were to participate in agricultural engagement programs that would further their understanding of careers and learning opportunities in agriculture and fisheries.

Conclusion and Recommendations

Respondents agree that agriculture and fisheries may offer many opportunities for those who are willing to embrace it as their careers. As regards students’ understanding that agriculture and fisheries do not only involve farming and fishing, they are also aware that other career opportunities may stem out from this field. They became aware that agriculture and fisheries are careers that are not only seen in the field and ponds where people get too much dirt out of their work, but it may also include other workplaces such as schools, scientific laboratories, offices, and stores.

An intervention program that exposes students on first-hand agriculture and fisheries activities could change their perception towards different career opportunities. Lectures, games and trainings as well as career counselling and guidance, entrepreneurship and basic organizational skills were effective in transforming their perception favorably towards agri-fishery careers.

It is therefore recommended that, in order to encourage positive outlook toward agri-fishery careers, the younger generation should be made aware to the opportunities that they may offer. Secondary level education institutions may venture on the following possible course of actions:

- a. Strengthening of the career guidance programs towards introducing agri-fishery related careers as possible track for students in senior high school.
- b. Crafting of strategic plans or intervention programs that would include farm and countryside educational tours, hands-on activities and immersion of students in agriculture and fisheries.



c. Providing students with exposure opportunities on various modern agri-fishery technologies to eradicate the notion that agri-fishery is difficult manual job only.

It is also recommended that further studies on the actual career choices of students participating in agriculture and fisheries intervention programs be undertaken to validate the change in their perception of agri-fishery careers and determine the impact of these engagements. Future research should also include the development of agricultural knowledge assessment for parents to better understand their knowledge on agriculture and fisheries, which may affect the career decision making of their children.

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References

- American Psychological Association (APA). (n.d.). *APA Dictionary of Psychology*. Retrieved from <https://dictionary.apa.org/pretest-posttest-design>
- Baker, L. M., Irani, T., & Abrams, K. (2011). Communicating Strategically with Generation Me: Aligning Students' Career Needs with Communication about Academic Programs and Available Careers. *North American Colleges and Teachers of Agriculture Journal (NACTA Journal)*, 55(2), 32-39. Retrieved from <https://www.jstor.org/stable/nactajournal.55.2.32>
- Burris, M. N. (2013). *A Study to Determine the Agricultural Perceptions of High School Students for the "I Love Farmers...They Feed My Soul!" Organization*. (Master's thesis). Faculty of California Polytechnic State University, San Luis Obispo, California. DOI: 10.15368/theses.2013.94
- Chan, J. R., De Borja, J. M. A., De Vera, J. L., Himoldang, J. G., Lansangan, R. V., Mercado, M. G. M., Samala, H., & Soliman, A. A. (2020). Constructivism and Pedagogical Practices of Science Teachers. *IOER International Multidisciplinary Research Journal*, 2(2), 1-11. DOI: 10.5281/zenodo.3824068
- Clemente, R. C. (2014). Predisposition Factors of Students' Choice in Agriculture, Fisheries and Natural Resources (AFNR) Courses (Luzon Area). *Asia Pacific Journal of Multidisciplinary Research*, 2(1), 170-177. Retrieved from <https://ejournals.ph/article.php?id=5740>



Duncan, D. W., & Broyles, T. (2004). An Evaluation of Student Knowledge and Perceptions toward Agriculture Before and After Attending a Governor's School for Agriculture. *Journal of Southern Agricultural Education Research*, 54(1), 280–292.

Fraze, L. B., Rutherford, T., Wingenbach, G., & Wolfskill, L. A. (2011). Urban High School Students' Perceptions about Agricultural Careers and General Agricultural Knowledge. *NACTA Journal*, 55(4), 75–81.

Gaboy, R. G., Battad, T. T., Mina-Roguel, S. S., & Sison, R. F. (2019). Young Agriculturists' Journey: The Agricultural Science and Technology School Tracer Study. *Indonesian Research Journal in Education (IRJE)*, 3(2), 319–339. Retrieved from <https://online-journal.unja.ac.id/irje/article/view/7898>

Hettige, S. T. (2005). Demographic and Economic Pressures to Move: Youth Aspirations and Livelihood Opportunities for Youth in the Liberal Economic Environment of Sri Lanka. In F. Gale, & S. Fahey (Eds.), *Youth in Transition: The Challenges of Generational Change in Asia* (pp. 227–241). Bangkok: Regional Unit for Social and Human Sciences in Asia and the Pacific, UNESCO.

Manalo IV, J. A., & Van de Fliert, E. (2013). Push and Pull Factors in Rural Filipino Youth's Outmigration from Agricultural Communities. *Asian Journal of Agriculture and Development*, 10(2), 59–73.

Matthews, B., & Falvey, L. (1999). Year 10 Students' Perceptions of Agricultural Careers: Victoria (Australia). *Journal of International Agricultural and Extension Education*, 6(1), 55–67. DOI: 10.5191/jiaee.1999.06106

Mercado, M. G. M., & Ibarra, F. P. (2019). ICT–Pedagogy Integration in Elementary Classrooms: Unpacking the Pre–Service Teachers' TPACK. *Indonesian Research Journal in Education (IRJE)*, 3(1), 29–56. <https://doi.org/10.22437/irje.v3i1.6506>

Padin, M. G. (2015, August 26). *Enrollment in Agriculture Courses Continues to Decline*. Retrieved from <https://businessmirror.com.ph/enrollment-in-agriculture-courses-continues-to-decline/>

Portnov–Neeman, Y., & Barak, M. (2013). Exploring Students' Perceptions about Learning in School: An Activity Theory Based Study. *Journal of Education and Learning*, 2(3), 9–25. DOI: 10.5539/jel.v2n3p9

Punch, S., & Sugden, F. (2013). Work, Education and Out–Migration among Children and Youth in Upland Asia: Changing Patterns of Labour and Ecological Knowledge in an Era of Globalisation. *Local Environment*, 18(3), 255–270. <https://doi.org/10.1080/13549839.2012.716410>

Ruth, A. M., Lundy, L. K., & Park, T. D. (2005). Glitz, Glamour, and the Farm: Portrayal of Agriculture as the Simple Life. *Journal of Applied Communications*, 89(4), 21–37. DOI: 10.4148/1051-0834.1311

Settle, Q., Doerfert, D. L., Irlbeck, E., Akers, C., Burris, S., Wingenbach, G., & Rutherford, T. (2012). The Effects of an Agricultural Communications Workshop on Self–Efficacy and Career Interest: A Comparison between Agriculture and Nonagriculture Students. *North American Colleges and Teachers of Agriculture Journal (NACTA Journal)*, 56(4), 71–77.



Sibayan, A. P. (2016). *Attracting the Youth to Agriculture*. Retrieved from <https://www.searca.org/knowledge-resources/1603-pre-download?pid=309>

Simon, A. B., Claravall, G. G., & Simon, S. R. (2013). Perceptions of Faculty and Students on the Agriculture Programs of ISU-Cabagan. *ISU-Cabagan Journal of Research*, 22(1), 37-44. Retrieved from <https://ejournals.ph/article.php?id=7633>

Smith-Hollins, C. M. (2009). *Barriers to Enrollment in Colleges of Agriculture: Perspectives of Currently Enrolled Students at 1862 Land-Grant Institutions*. (Doctoral dissertation). The Pennsylvania State University, Pennsylvania. Retrieved from https://etda.libraries.psu.edu/catalog?f%5Bcommittee_member_name_ssim%5D%5B%5D=Patreese+Donette+Ingram&f%5Bkeyword_ssim%5D%5B%5D=1862+land+grant+institutions&per_page=10&sort=last_name_ssi+asc%2C+title_ssi+asc