

The Effects of an Introductory Agriculture Curriculum on Student Knowledge



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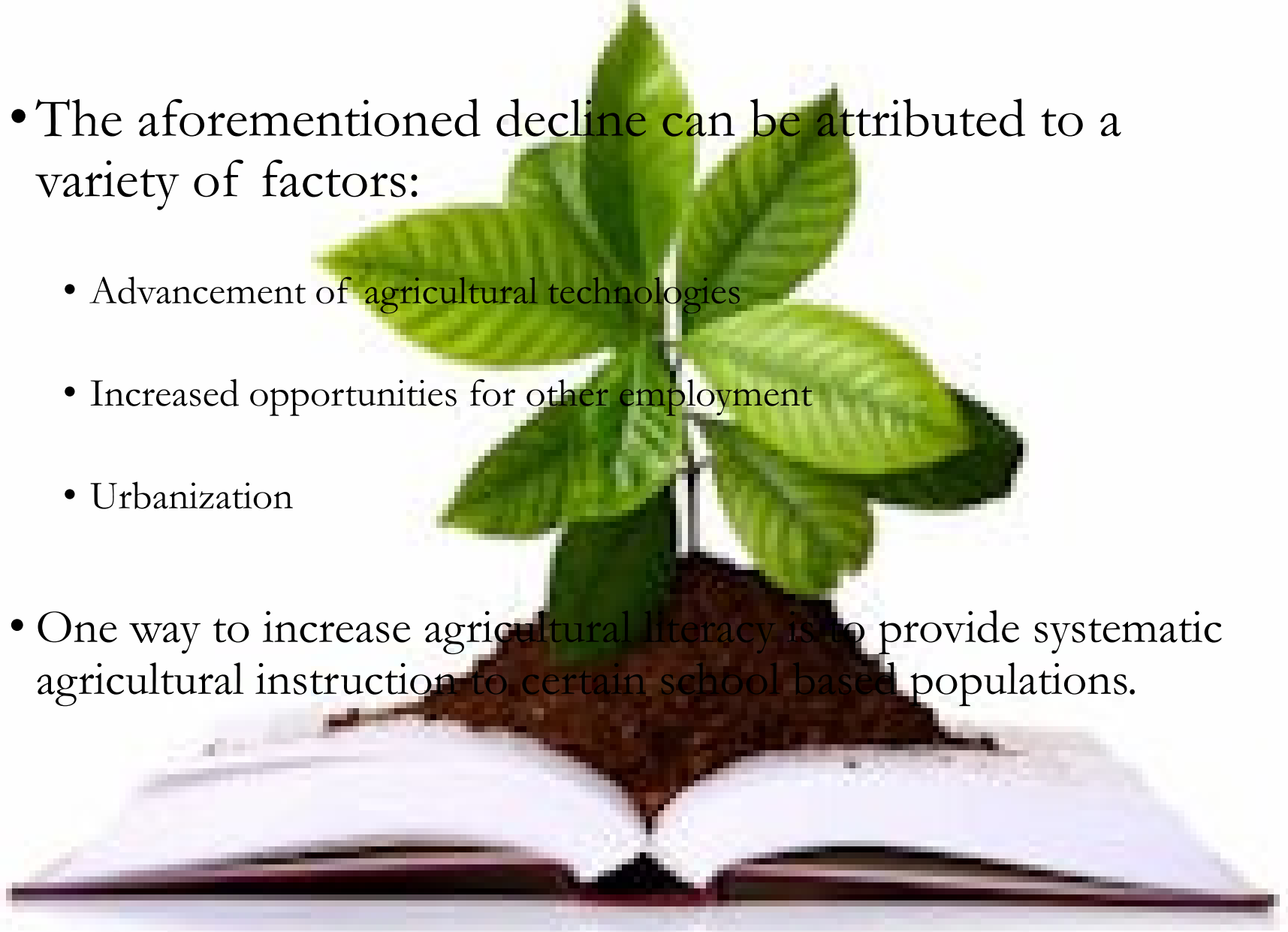
Introduction

- Agricultural literacy far from a new concept
 - First investigated in 1986 by Horn and Vining.
 - Further investigation by the National Research Council's 1988 publication "*Understanding Agriculture: New Directions for Education*"
 - Consensus definition of agricultural literacy in 1991 by Frick, Kahler, & Miller.
- The gradual decline of agricultural literacy from generation to subsequent generation is alarming.

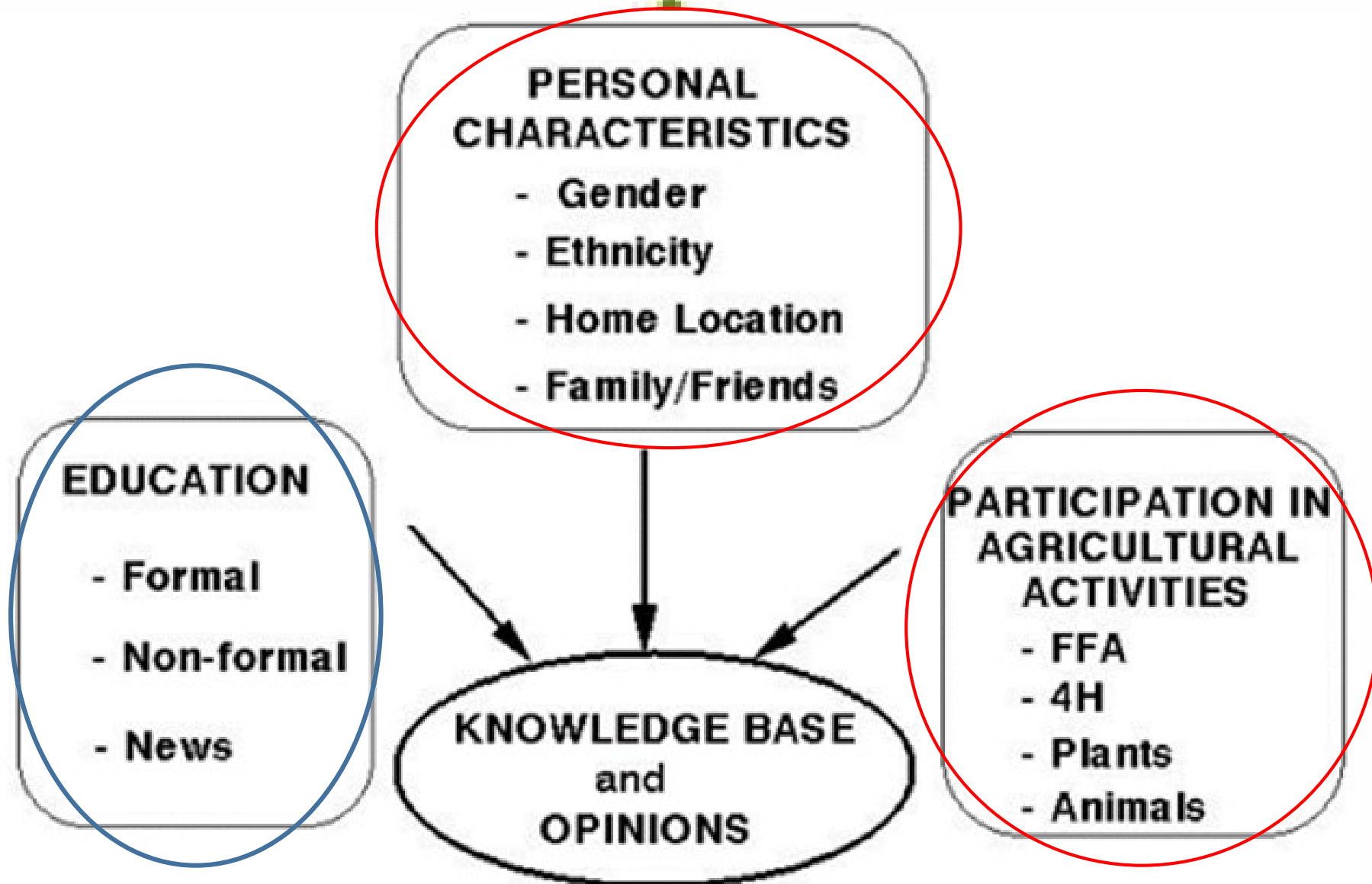


Introduction

- The aforementioned decline can be attributed to a variety of factors:
 - Advancement of agricultural technologies
 - Increased opportunities for other employment
 - Urbanization
- One way to increase agricultural literacy is to provide systematic agricultural instruction to certain school based populations.



Conceptual Framework

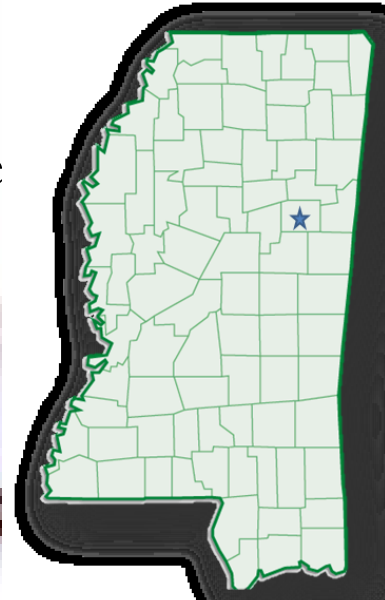


Purpose & Research Questions

The purpose of this study was to quantitatively and qualitatively investigate the level of agricultural knowledge among three groups of private school students and assess their perceptions of agriculture.

Research Questions:

1. What is the current level of agricultural knowledge among 10th grade biology students?
2. Was there a significant increase in agricultural knowledge agriculture after treatment?
3. What were student perceptions of agriculture before and after treatment?



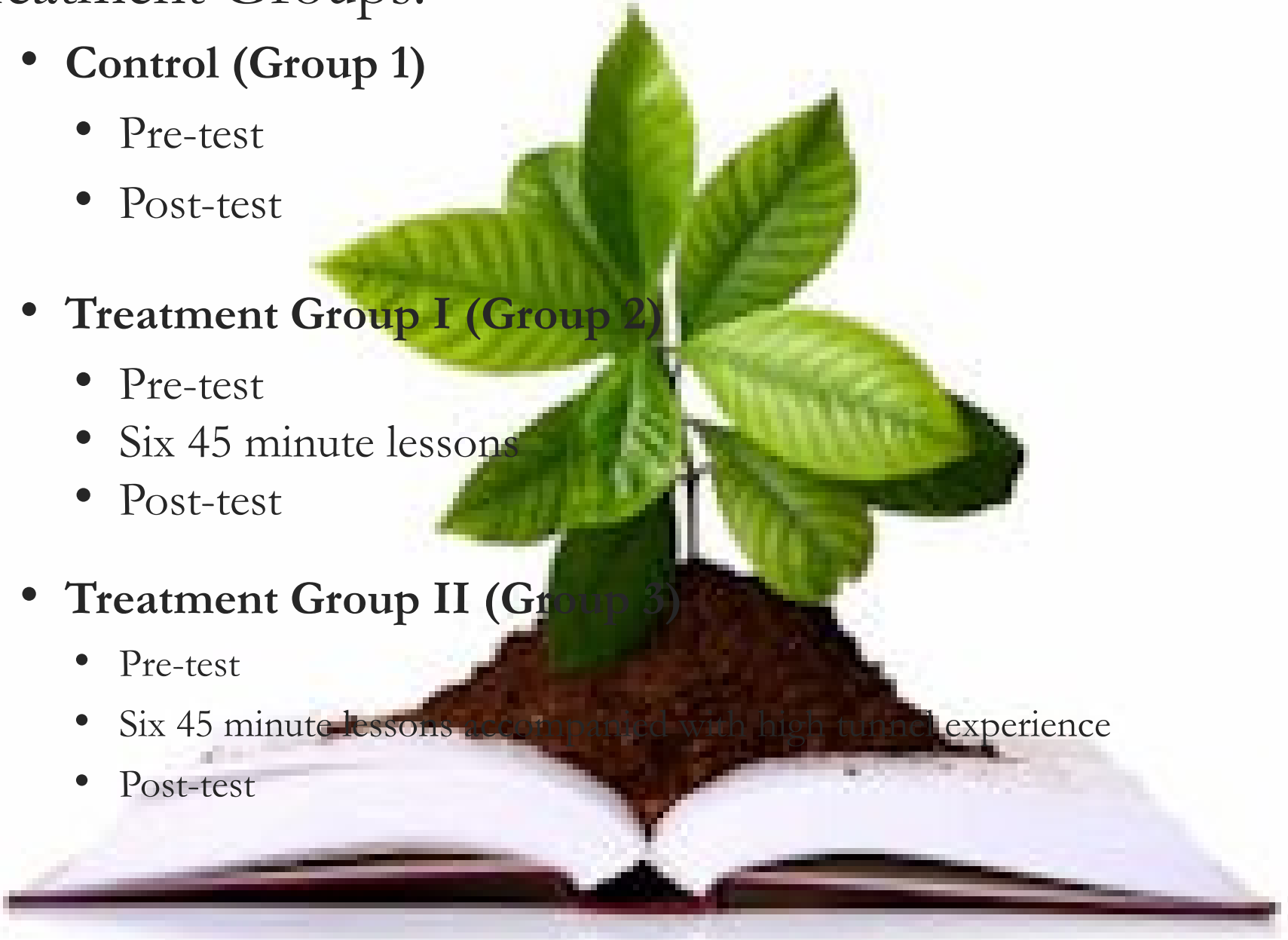
Population & Research Design

- The target population of this study were 10th graders at 3 private high schools in Northeast Mississippi.
- Quasi-experimental
- Non-randomized groups
- Pretest-posttest design with teaching interventions



Treatment Groups:

- **Control (Group 1)**
 - Pre-test
 - Post-test
- **Treatment Group I (Group 2)**
 - Pre-test
 - Six 45 minute lessons
 - Post-test
- **Treatment Group II (Group 3)**
 - Pre-test
 - Six 45 minute lessons accompanied with high tunnel experience
 - Post-test



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NOURISHING THE PLANET IN THE 21ST CENTURY



A CURRICULUM MODULE FOR
HIGH SCHOOL SCIENCE GRADES 9-12

SECOND EDITION

NUTRIENTS  FOR LIFE
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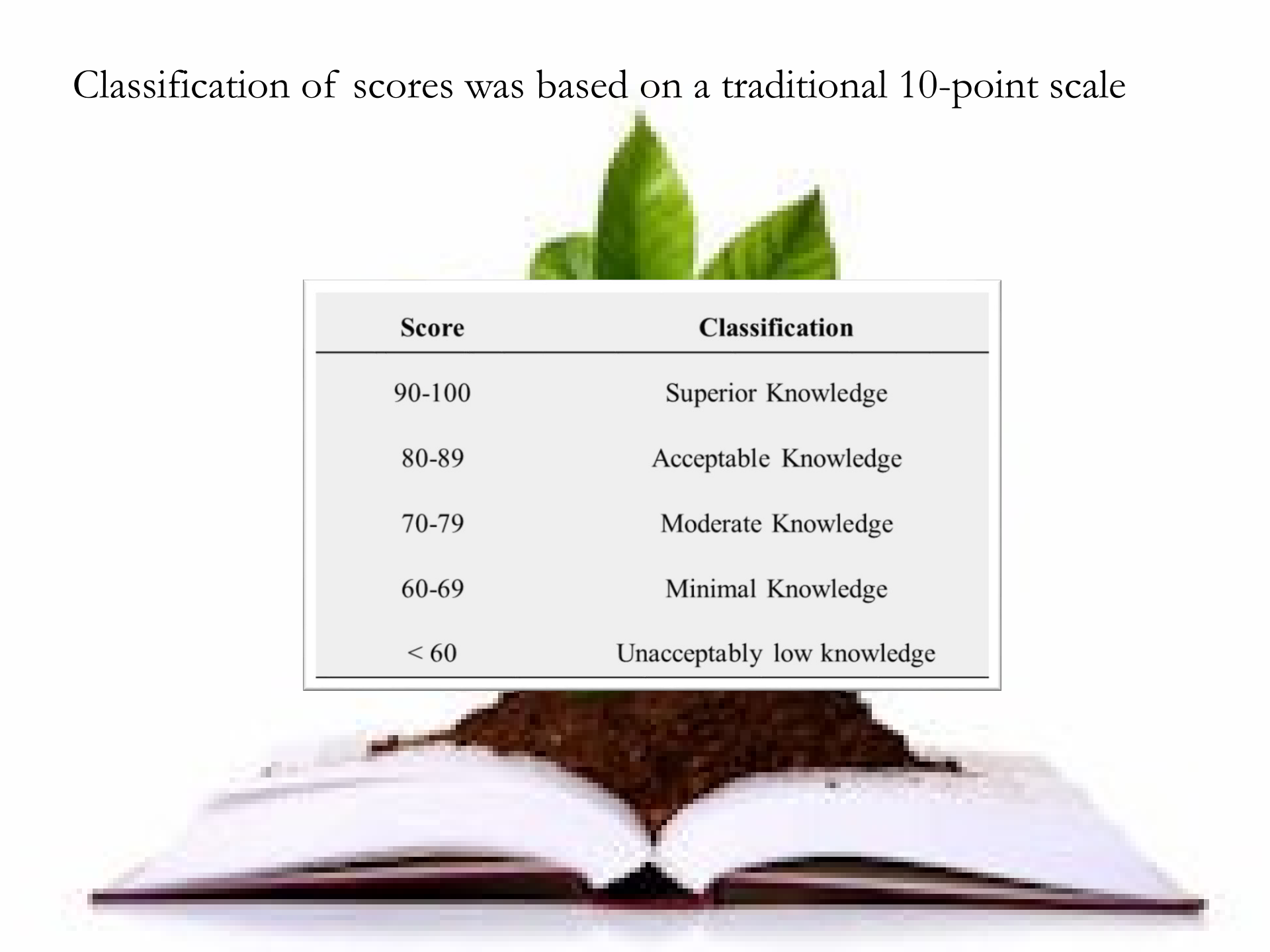


Data Analysis

- Frequencies, means, and standard deviations
- Analysis of variance
- Paired t-test
- Focus group responses analyzed and coded into themes.



Classification of scores was based on a traditional 10-point scale



Score	Classification
90-100	Superior Knowledge
80-89	Acceptable Knowledge
70-79	Moderate Knowledge
60-69	Minimal Knowledge
< 60	Unacceptably low knowledge

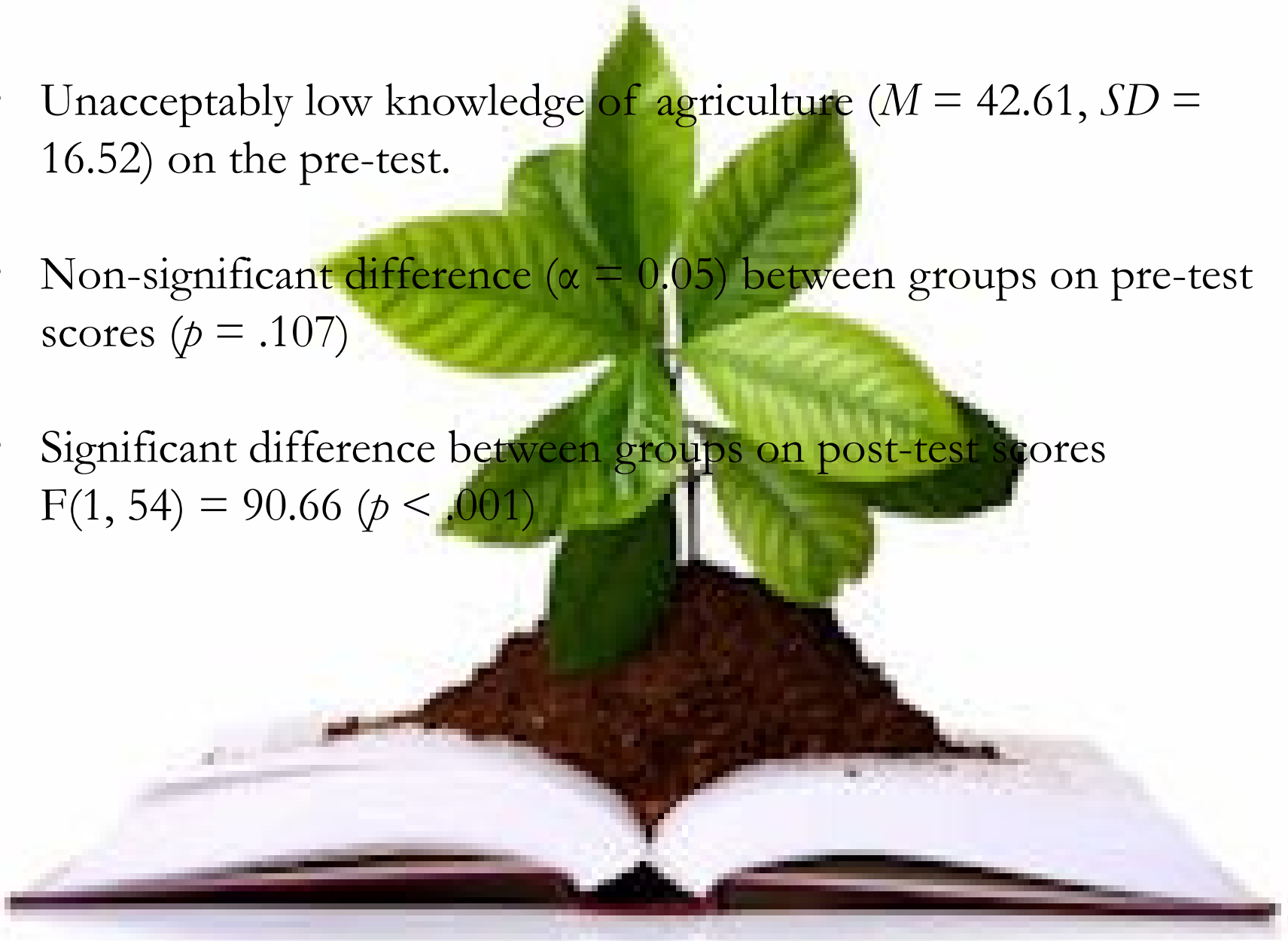
Demographics

- 57 students participated in the study
 - 30 Male
 - 27 Female
- Age ($M = 14.3$)
- Race or Ethnicity
 - 93% Caucasian
 - 5% Asian
 - 2% African-American
- No students were familiar with FFA or similar youth agricultural groups
- Few (5%) had taken any type of agricultural class before



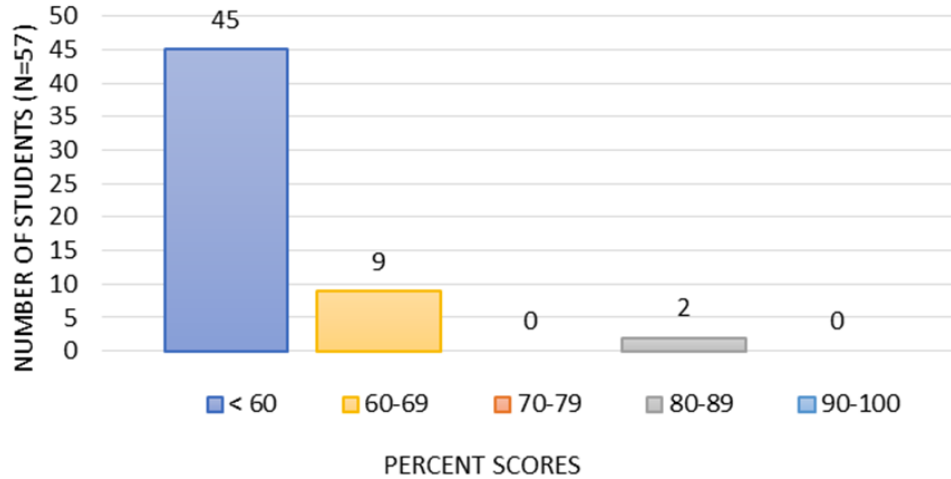
Results

- Unacceptably low knowledge of agriculture ($M = 42.61$, $SD = 16.52$) on the pre-test.
- Non-significant difference ($\alpha = 0.05$) between groups on pre-test scores ($p = .107$)
- Significant difference between groups on post-test scores $F(1, 54) = 90.66$ ($p < .001$)

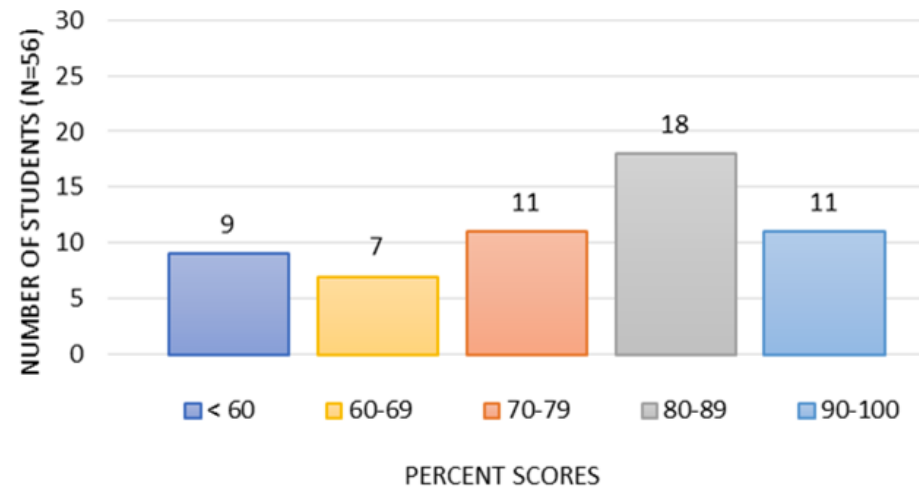


Results

Frequency Distribution of Pre-Test Scores

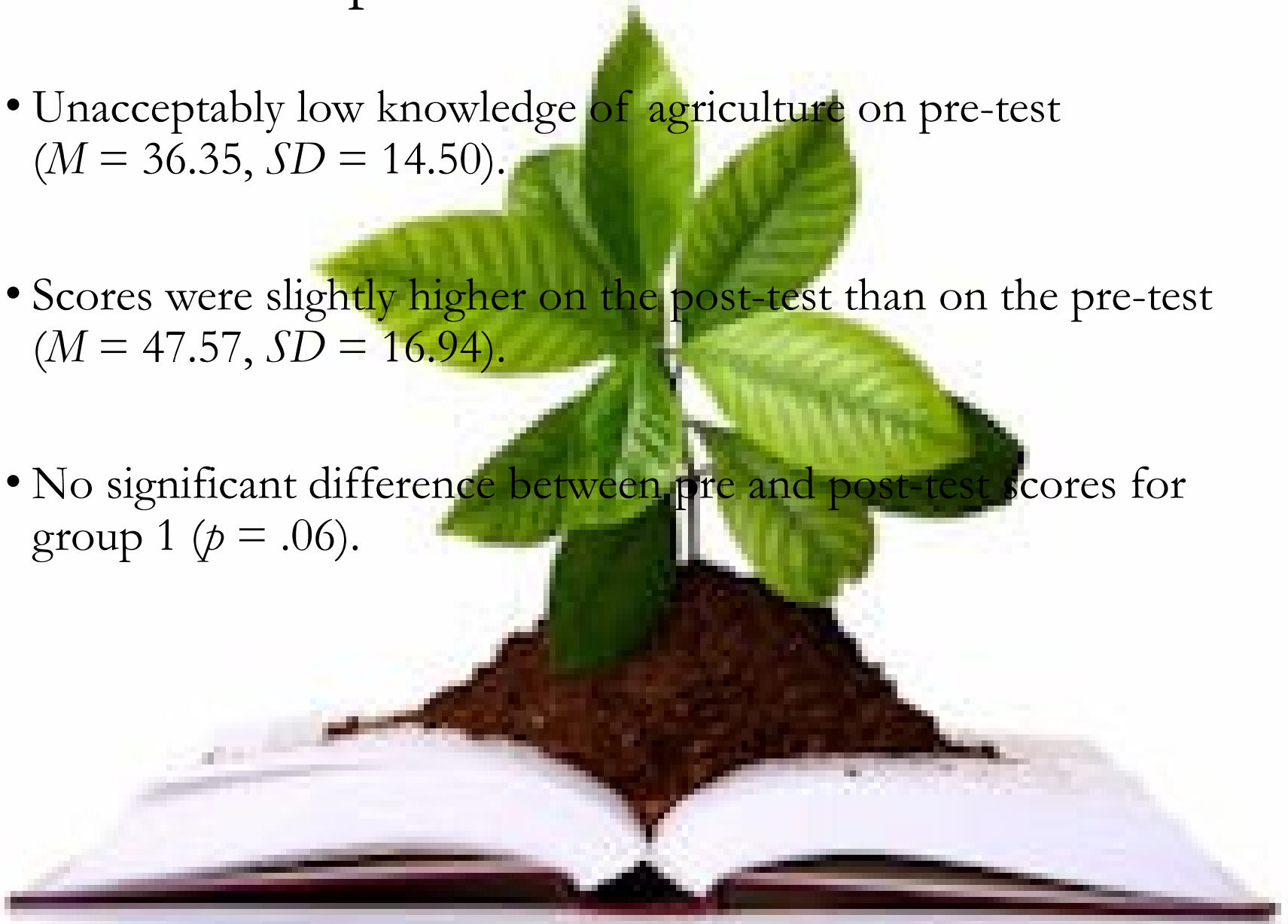


Frequency Distribution of Post-Test Scores



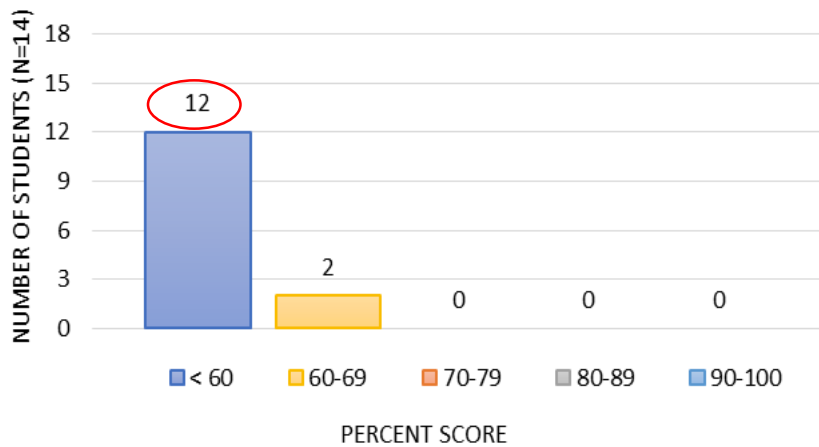
Control Group

- Unacceptably low knowledge of agriculture on pre-test ($M = 36.35$, $SD = 14.50$).
- Scores were slightly higher on the post-test than on the pre-test ($M = 47.57$, $SD = 16.94$).
- No significant difference between pre and post-test scores for group 1 ($p = .06$).

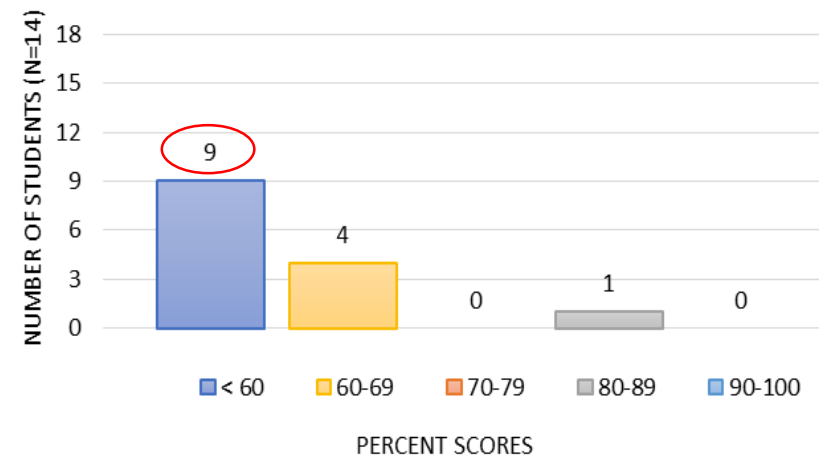


Control Group

Frequency Distribution of Pre-Test Scores



Frequency Distribution of Post-Test Scores

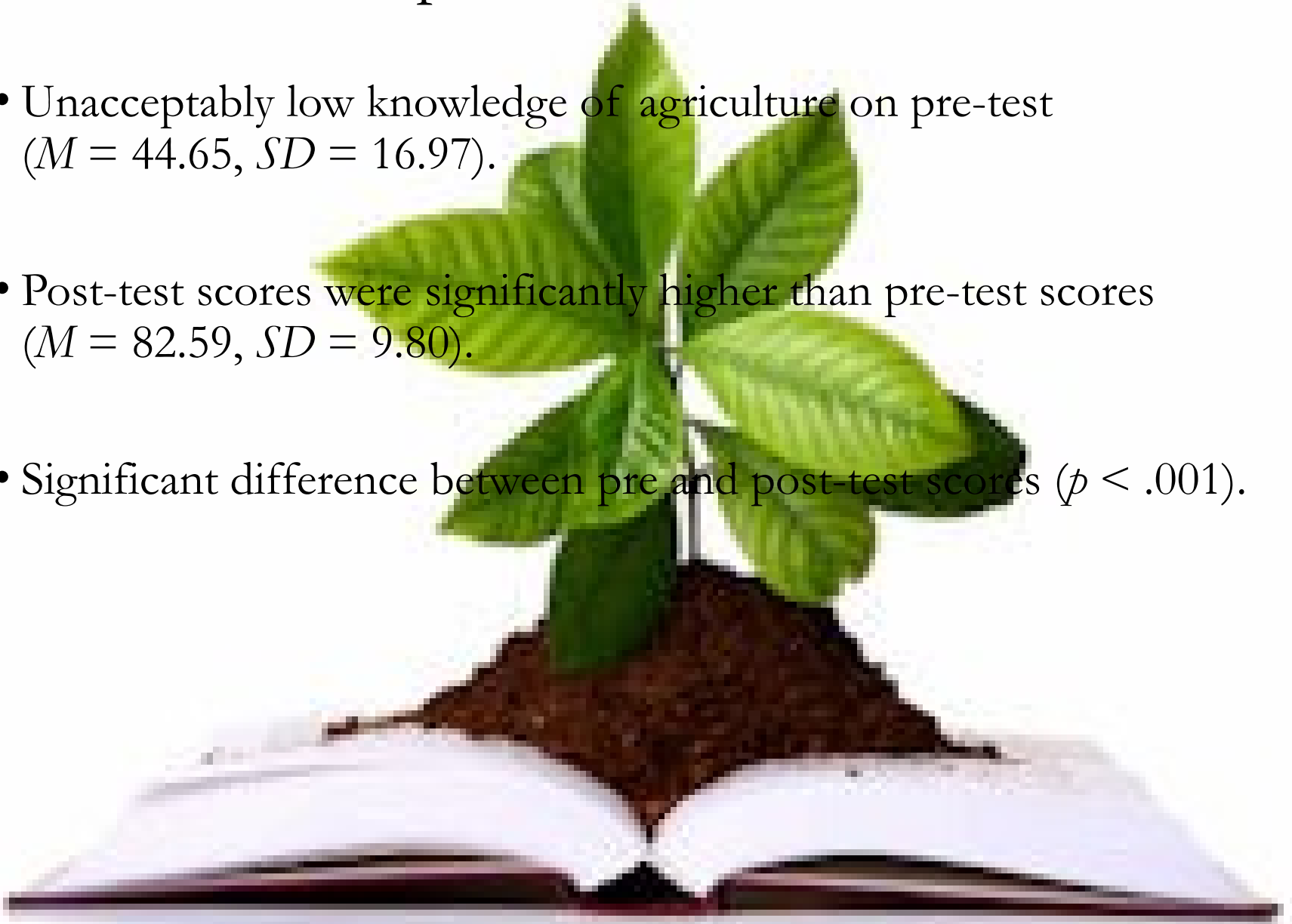


Paired Differences

	<i>M</i>	<i>SD</i>	Std. Error Mean	<i>t</i>	df	Sig.
Pre – Post-Test	-11.21	20.52	5.48	-2.04	13	.062

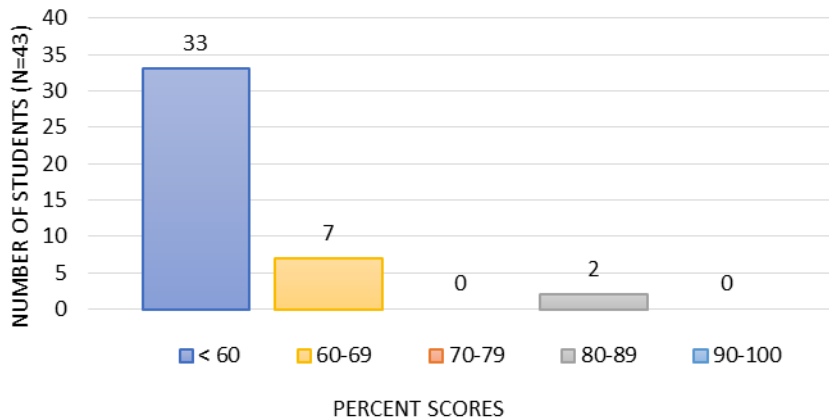
Treatment Groups

- Unacceptably low knowledge of agriculture on pre-test ($M = 44.65$, $SD = 16.97$).
- Post-test scores were significantly higher than pre-test scores ($M = 82.59$, $SD = 9.80$).
- Significant difference between pre and post-test scores ($p < .001$).

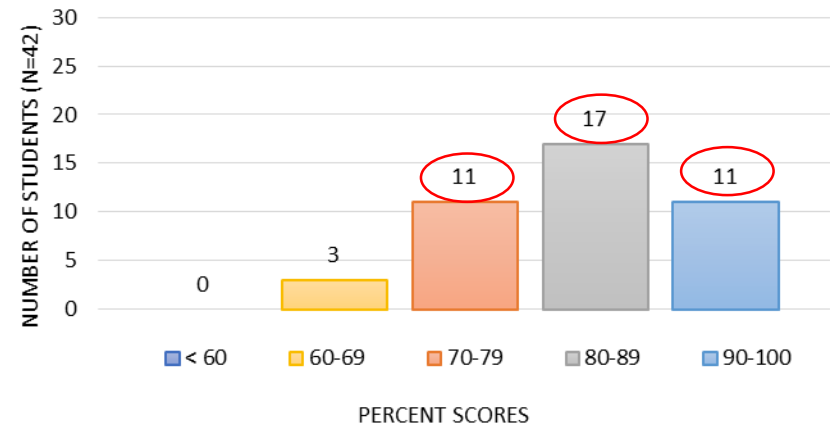


Treatment Groups

Frequency Distribution of Pre-Test Scores



Frequency Distribution of Post-Test Scores



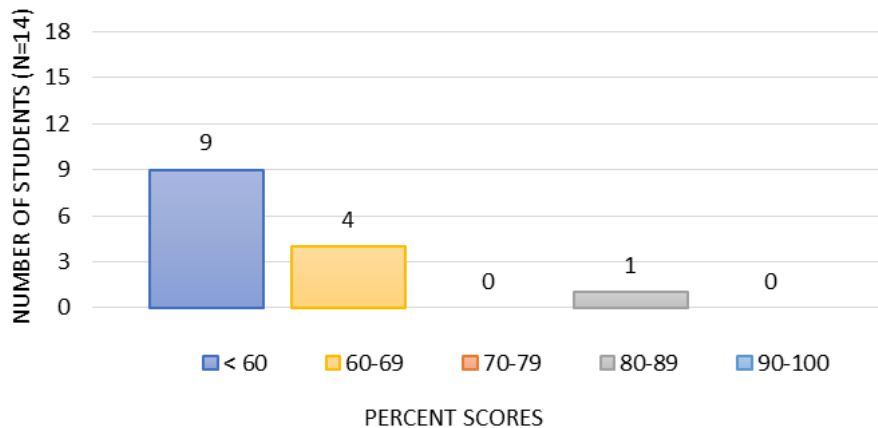
Paired Differences

	<i>M</i>	<i>SD</i>	Std. Error Mean	<i>t</i>	<i>df</i>	<i>Sig.</i>
Pre – Post-Test	37.52	19.28	2.97	12.61	41	.000*

Comparison of Groups

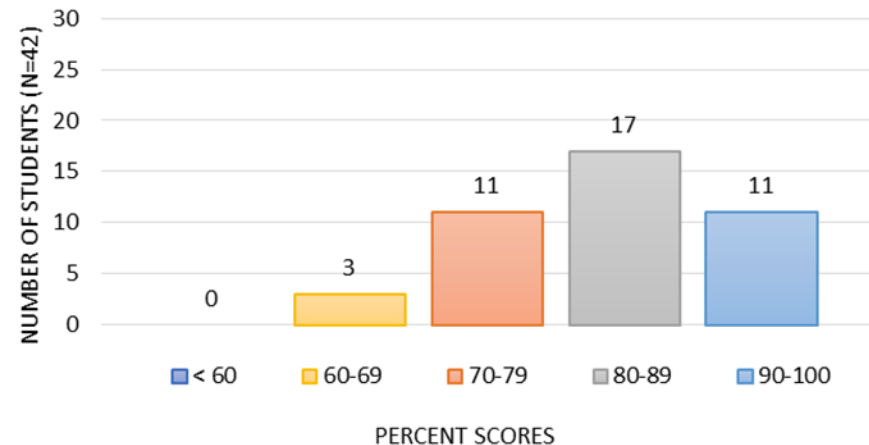
- Students in treatment groups ($M = 82.59$, $SD = 9.83$) scored higher on the post-test than students in the control group ($M = 47.57$, $SD = 16.94$).

Frequency Distribution of Post-Test Scores



Control Group

Frequency Distribution of Post-Test Scores



Treatment Group

Student Perceptions

Theme 1: A low and negative perception of and awareness of agriculture.

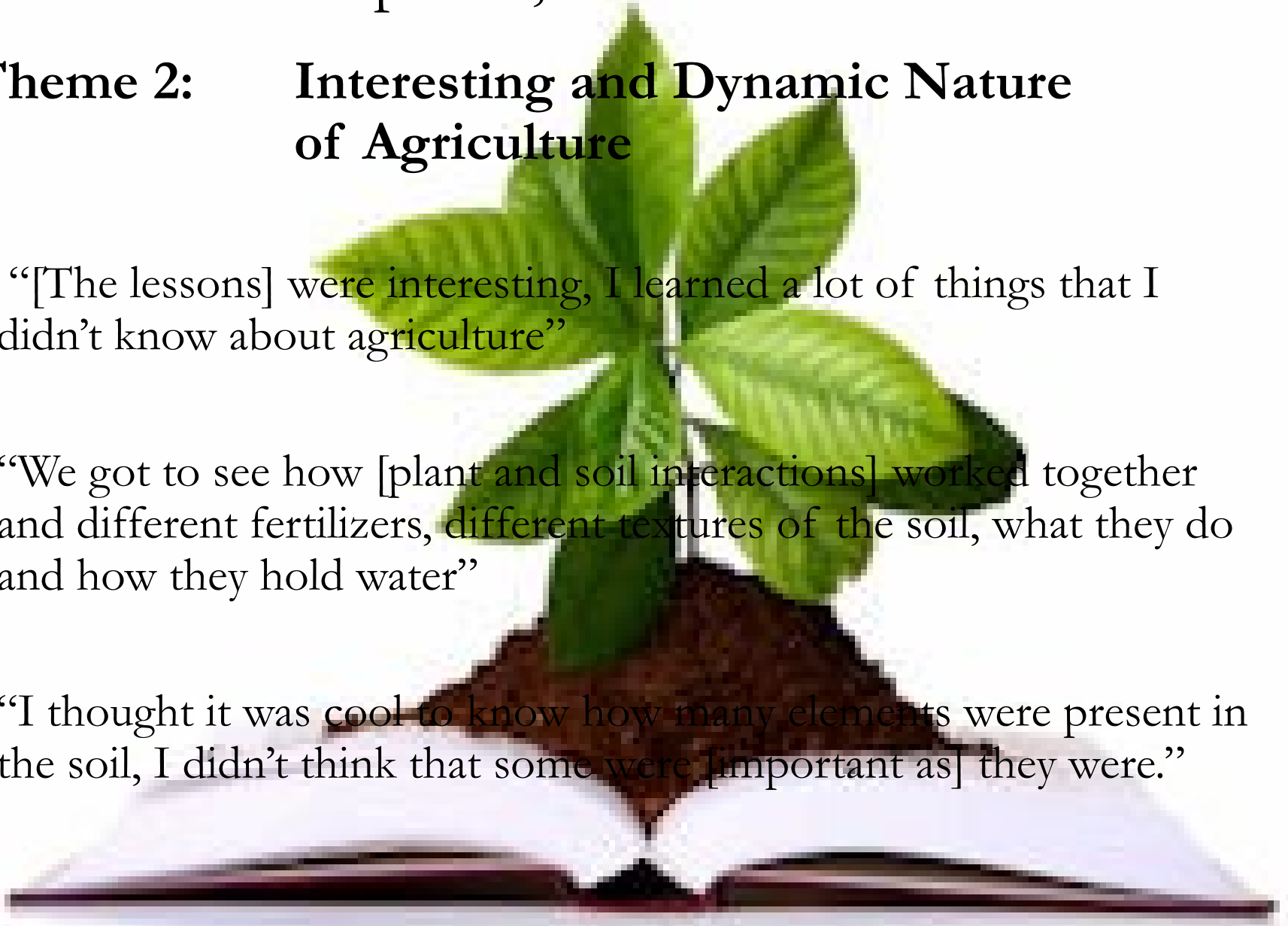
- “I didn’t think [agriculture was] interesting because it was just dirt.”
- “When I think of agriculture, I think of farming and my grandparents.”
- [Agriculture is just], “how we get our food and where it comes from” and “growing crops to sell.”



Student Perceptions, continued.

Theme 2: Interesting and Dynamic Nature of Agriculture

- “[The lessons] were interesting, I learned a lot of things that I didn’t know about agriculture”
- “We got to see how [plant and soil interactions] worked together and different fertilizers, different textures of the soil, what they do and how they hold water”
- “I thought it was cool to know how many elements were present in the soil, I didn’t think that some were [important as] they were.”



Student Perceptions, continued.

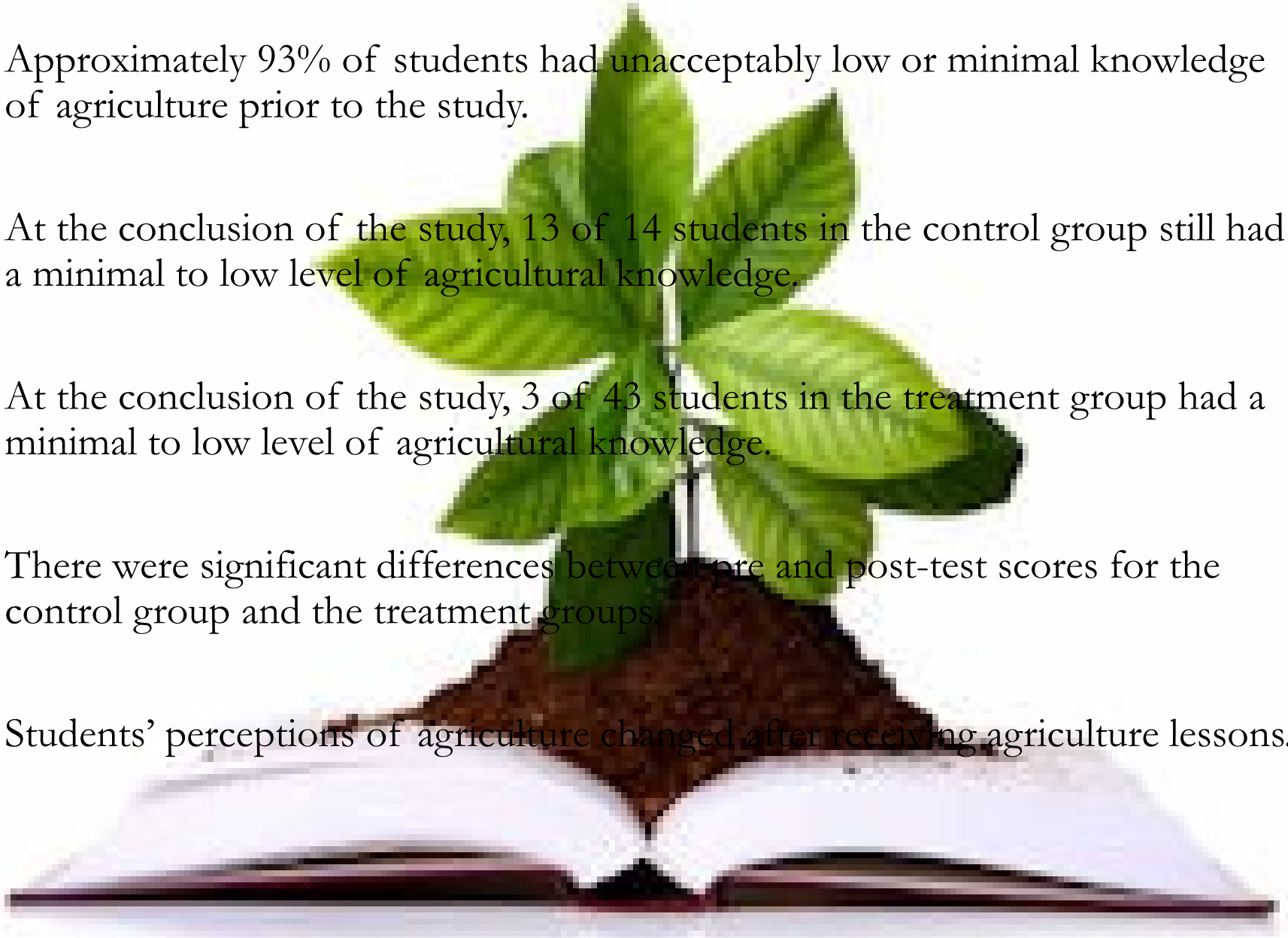
Theme 3: Increased appreciation for agriculture and its importance in society

- “[Agriculture] is more in-depth and more complex than I thought.”
- “We appreciate it more now, [I] understand how hard people work to get [food] to you”
- Agriculture is a bigger deal than I thought it was”
- “I [used] to just think ‘there goes food.’”



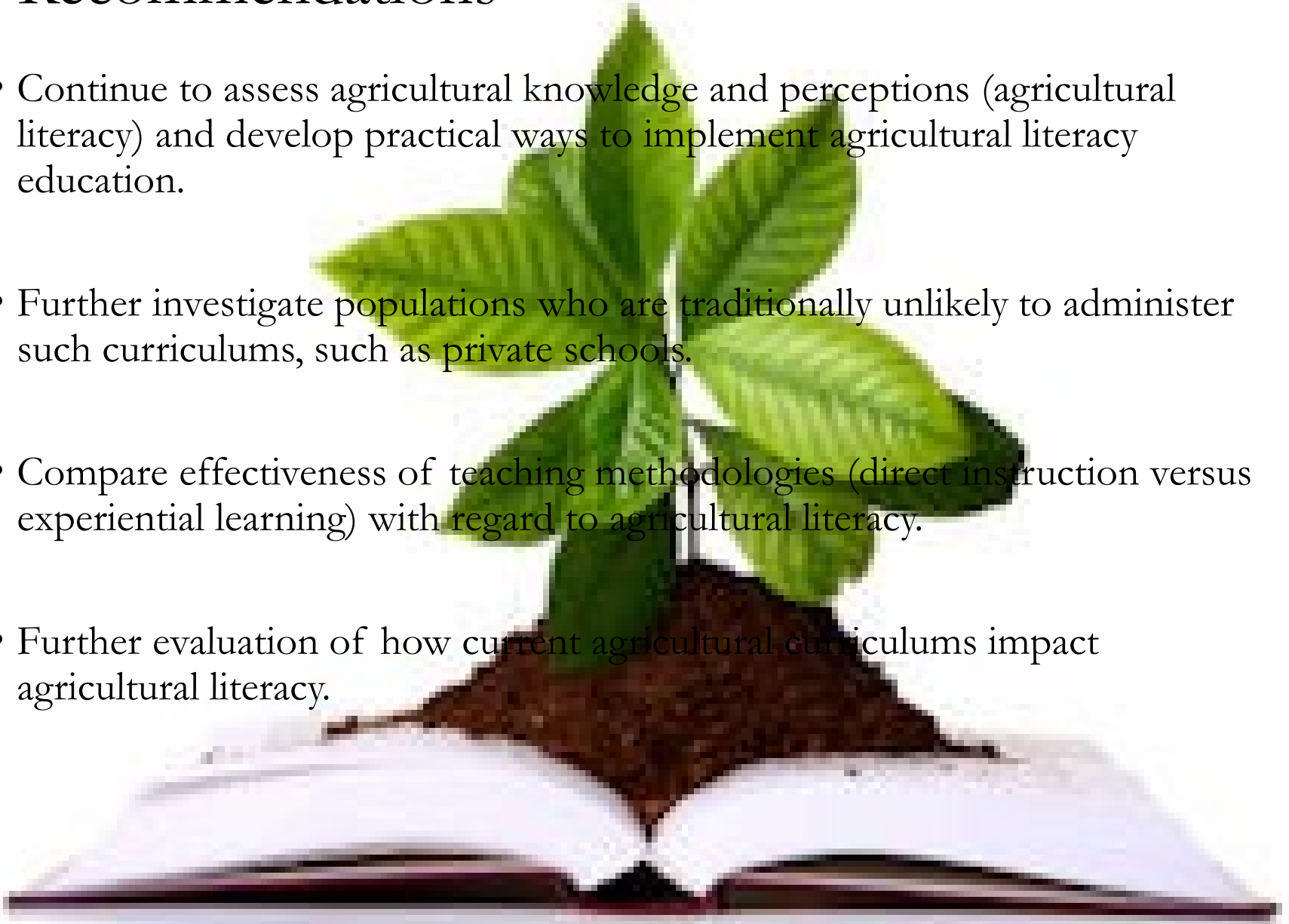
Conclusions

- Approximately 93% of students had unacceptably low or minimal knowledge of agriculture prior to the study.
- At the conclusion of the study, 13 of 14 students in the control group still had a minimal to low level of agricultural knowledge.
- At the conclusion of the study, 3 of 43 students in the treatment group had a minimal to low level of agricultural knowledge.
- There were significant differences between pre and post-test scores for the control group and the treatment groups.
- Students' perceptions of agriculture changed after receiving agriculture lessons.



Recommendations

- Continue to assess agricultural knowledge and perceptions (agricultural literacy) and develop practical ways to implement agricultural literacy education.
- Further investigate populations who are traditionally unlikely to administer such curriculums, such as private schools.
- Compare effectiveness of teaching methodologies (direct instruction versus experiential learning) with regard to agricultural literacy.
- Further evaluation of how current agricultural curriculums impact agricultural literacy.



Thank you!

