

# **Learning Style Preferences of Undergraduate Dietetics, Exercise Science, and Athletic Training Students**

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# Abstract

- **Introduction:** There is a greater need to assess students' learning style preferences with the recent shift in teaching methods. The objectives of this study were to assess the preferred learning style of college students and evaluate if learning style preferences varied among students majoring in dietetics, exercise science, and athletic training.
- **Methods:** Learning Style Questionnaires (LSQ) were distributed to college students (N = 695, mean age  $20.5 \pm 1.7$  years) enrolled in health science related courses at three Midwestern universities. Chi square test for independence and chi square goodness of fit analyses were performed to determine if there was a significant relationship between learning style and college major and to evaluate if there was a significant preference of learning style among dietetics, exercise science, and athletic training majors.
- **Results:** The majority of students surveyed preferred a converger learning style (52.4%) followed by assimilator (22.7%), accommodator (14.1%), and diverger (3.4%). Some students were observed to prefer a combination of two learning styles including accommodator/converger (3.0%), assimilator/converger (2.6%), and assimilator/diverger (1.1%). Results indicated a significant relationship between college major and learning style ( $\chi^2=44.16$ ,  $p<.05$ ). Students in dietetics, exercise science, and athletic training were all observed to have a significant learning style preference. The majority of exercise science students (52.6%) and athletic training students (71.4%) preferred converger learning style. Alternatively, dietetics students were divided with 33% preferring converger and 24.8% preferring assimilator.
- **Discussion:** Understanding preferred learning styles of college students in different academic programs may guide methods of instruction and increase the effectiveness of teaching and learning.

# Introduction

- There is a greater need to assess students' learning style preferences with the recent shift in teaching methods.

# Background

## Four Stages of the Learning Cycle

<p><b>Concrete Experience (CE)</b></p> <ul style="list-style-type: none"><li>• Learning from feeling</li></ul>	<p><b>Reflective Observation (RO)</b></p> <ul style="list-style-type: none"><li>• Learning by watching and listening</li></ul>
<p><b>Abstract Conceptualization (AC)</b></p> <ul style="list-style-type: none"><li>• Learning by thinking</li></ul>	<p><b>Active Experimentation (AE)</b></p> <ul style="list-style-type: none"><li>• Learning by doing</li></ul>

# Background

## The Four Learning Styles

<h3>Converger (AC/AE)</h3> <ul style="list-style-type: none"><li>• Best at finding practical uses for ideas and theories</li></ul>	<h3>Diverger (CE/RO)</h3> <ul style="list-style-type: none"><li>• Best at viewing concrete situations from many different points of view</li></ul>
<h3>Assimilator (AC/RO)</h3> <ul style="list-style-type: none"><li>• Best at understanding a wide range of information and putting it into concise, logical form</li></ul>	<h3>Accomodator (CE/AE)</h3> <ul style="list-style-type: none"><li>• Best at learning primarily from “hands-on” experience</li></ul>

# Purpose

- The objectives of this study were to:
  - 1) assess the preferred learning style of college students
  - 2) evaluate if learning style preferences varied among students majoring in dietetics, exercise science, and athletic training

# Methods

- Participants
  - College students (N = 695, mean age  $20.5 \pm 1.7$  years) enrolled in health science related courses at three Midwestern universities
  - Study received approval from the NDSU Institutional Review Board prior to implementation

# Methods

- Instrument
  - Learning Style Questionnaire (LSQ)<sup>1</sup>

# Methods

Student Learning Style Questionnaire				
<p><b>Instructions:</b> Following is a list of 40 word pairs. For each pair, decide which one of the two words is more characteristic of your learning style when compared to the other word. Then decide if the word describes what you generally prefer. If it is <i>most of the time</i>, then circle the extreme response ("A" or "E", whichever is appropriate). If it is <i>over half of the time</i> but not most of the time, then circle the next response ("B" or "D", whichever is appropriate). If you cannot decide between the two words, circle "C".</p>				
A	B	C	D	E
Generally (Most of the time)	Over Half the Time	About Half the Time	Over Half the Time	Generally (Most of the time)
1. Spontaneous.....	A - B - C - D - E	.....	.....	Thinking
2. Observation.....	A - B - C - D - E	.....	.....	Participation
3. Reserved.....	A - B - C - D - E	.....	.....	Demonstrative
4. Sensing.....	A - B - C - D - E	.....	.....	Thinking
5. Premonition.....	A - B - C - D - E	.....	.....	Reason
6. Active.....	A - B - C - D - E	.....	.....	Reserved
7. Participation.....	A - B - C - D - E	.....	.....	Observation
8. Watching.....	A - B - C - D - E	.....	.....	Acting
9. Observing.....	A - B - C - D - E	.....	.....	Doing
10. Deliberative.....	A - B - C - D - E	.....	.....	Reason
11. Acting.....	A - B - C - D - E	.....	.....	Reflecting
12. Perceptual.....	A - B - C - D - E	.....	.....	Intellectual
13. Perform.....	A - B - C - D - E	.....	.....	Examine
14. Emotional.....	A - B - C - D - E	.....	.....	Rational
15. Consider.....	A - B - C - D - E	.....	.....	Impulsive
16. Operative.....	A - B - C - D - E	.....	.....	Watchful
17. Reason.....	A - B - C - D - E	.....	.....	Hunch
18. Impulsive.....	A - B - C - D - E	.....	.....	Planning
19. Produce.....	A - B - C - D - E	.....	.....	Watch
20. Witness.....	A - B - C - D - E	.....	.....	Exhibit

	A	B	C	D	E
	Generally (Most of the time)	Over Half the Time	About Half the Time	Over Half the Time	Generally (Most of the time)
21. Feeling.....	A - B - C - D - E	.....	.....	.....	Thinking
22. Ponder.....	A - B - C - D - E	.....	.....	.....	Do
23. Involved.....	A - B - C - D - E	.....	.....	.....	Distant
24. Analytical.....	A - B - C - D - E	.....	.....	.....	Emotional
25. Intuitive.....	A - B - C - D - E	.....	.....	.....	Reasoning
26. Careful.....	A - B - C - D - E	.....	.....	.....	Emotional
27. Logical.....	A - B - C - D - E	.....	.....	.....	Sentimental
28. Perception.....	A - B - C - D - E	.....	.....	.....	Reason
29. Thinking.....	A - B - C - D - E	.....	.....	.....	Instinctive
30. Hunch.....	A - B - C - D - E	.....	.....	.....	Logical
31. Passive.....	A - B - C - D - E	.....	.....	.....	Active
32. Doing.....	A - B - C - D - E	.....	.....	.....	Watching
33. View.....	A - B - C - D - E	.....	.....	.....	Execute
34. Resolving.....	A - B - C - D - E	.....	.....	.....	Feeling
35. Reflecting.....	A - B - C - D - E	.....	.....	.....	Performing
36. Intellectual.....	A - B - C - D - E	.....	.....	.....	Emotional
37. Reflective.....	A - B - C - D - E	.....	.....	.....	Productive
38. Evaluative.....	A - B - C - D - E	.....	.....	.....	Sensitive
39. Solve.....	A - B - C - D - E	.....	.....	.....	Reflect
40. Exercise.....	A - B - C - D - E	.....	.....	.....	View

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# Methods

- Data Analysis
  - Chi square test for independence
    - To determine if there was a significant relationship between learning style and college major
  - Chi square goodness of fit
    - To evaluate if there was a significant preference of learning style among dietetics, exercise science, and athletic training majors
  - An alpha level was set at  $<0.05$

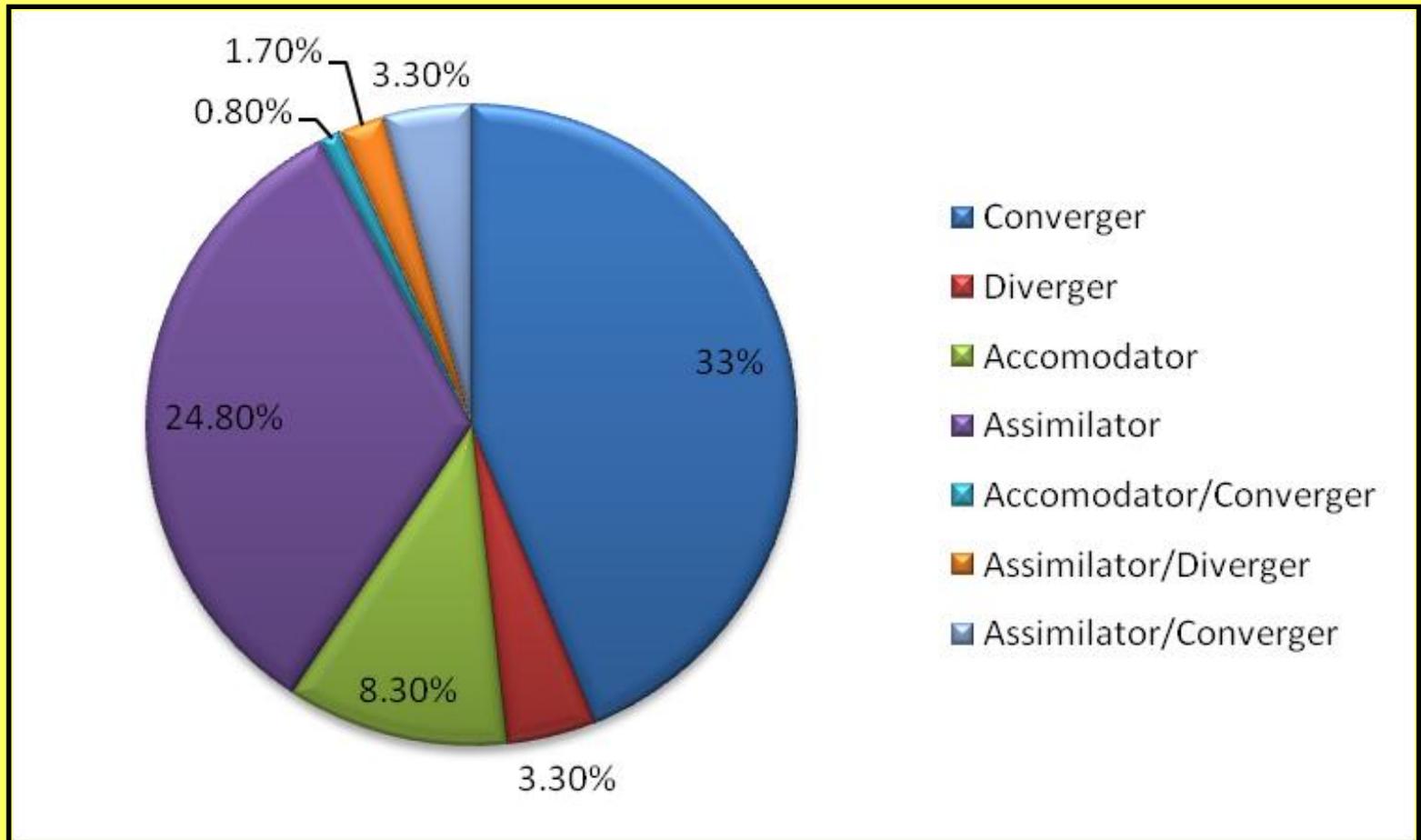
# Results

## Demographic Characteristics of Students (N=695)

	n	%
<b>Year in School</b>		
Freshman	100	14.4
Sophomore	212	30.5
Junior	170	24.4
Senior	144	20.7
5 <sup>th</sup> year+	69	9.9
<b>Major</b>		
Dietetics	121	17.4
Exercise Science	285	41.2
Athletic Training	56	8.0
Other	233	33.2

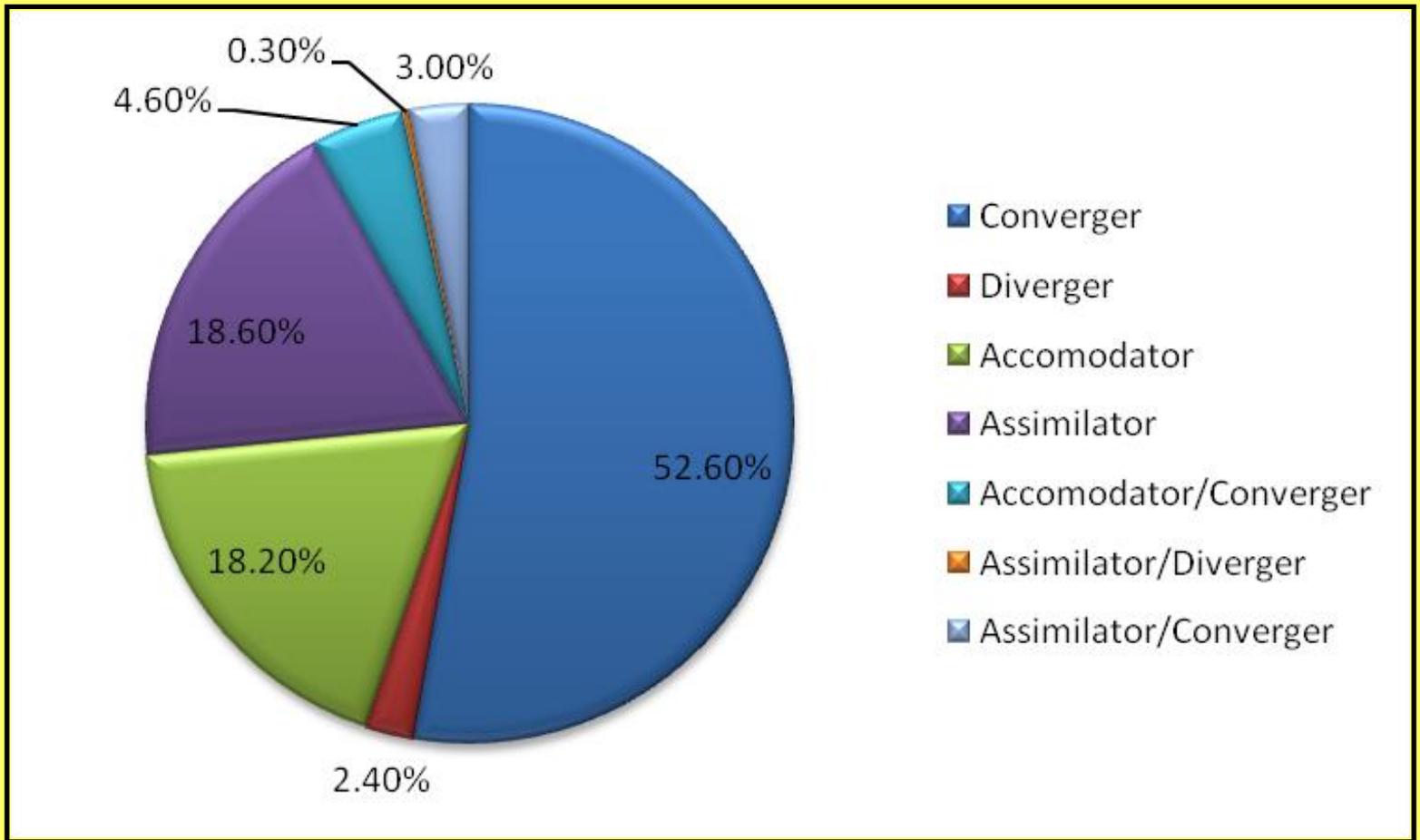
# Results

Learning Styles among Dietetics Students (n=121)



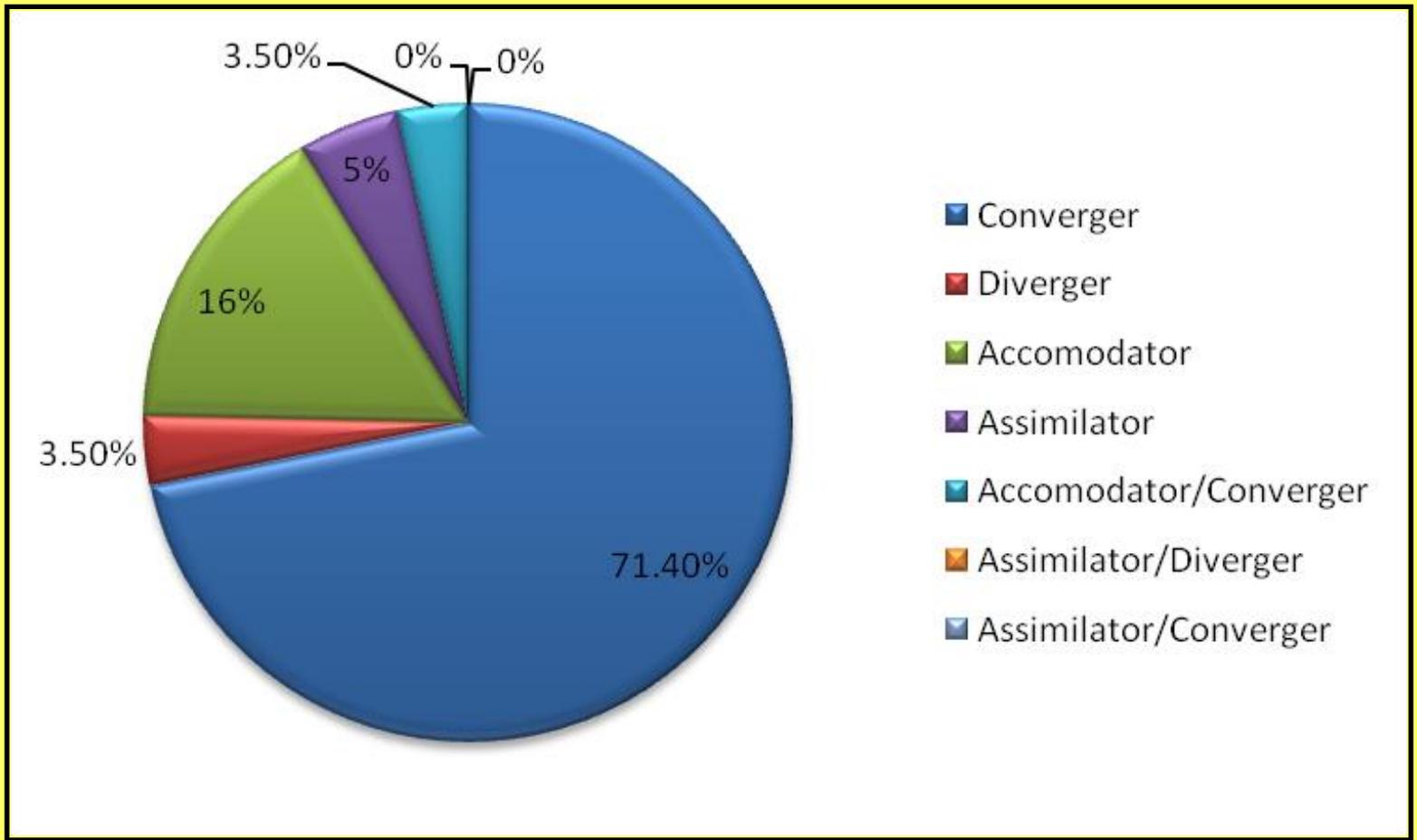
# Results

Learning Styles among Exercise Science Students (n=285)



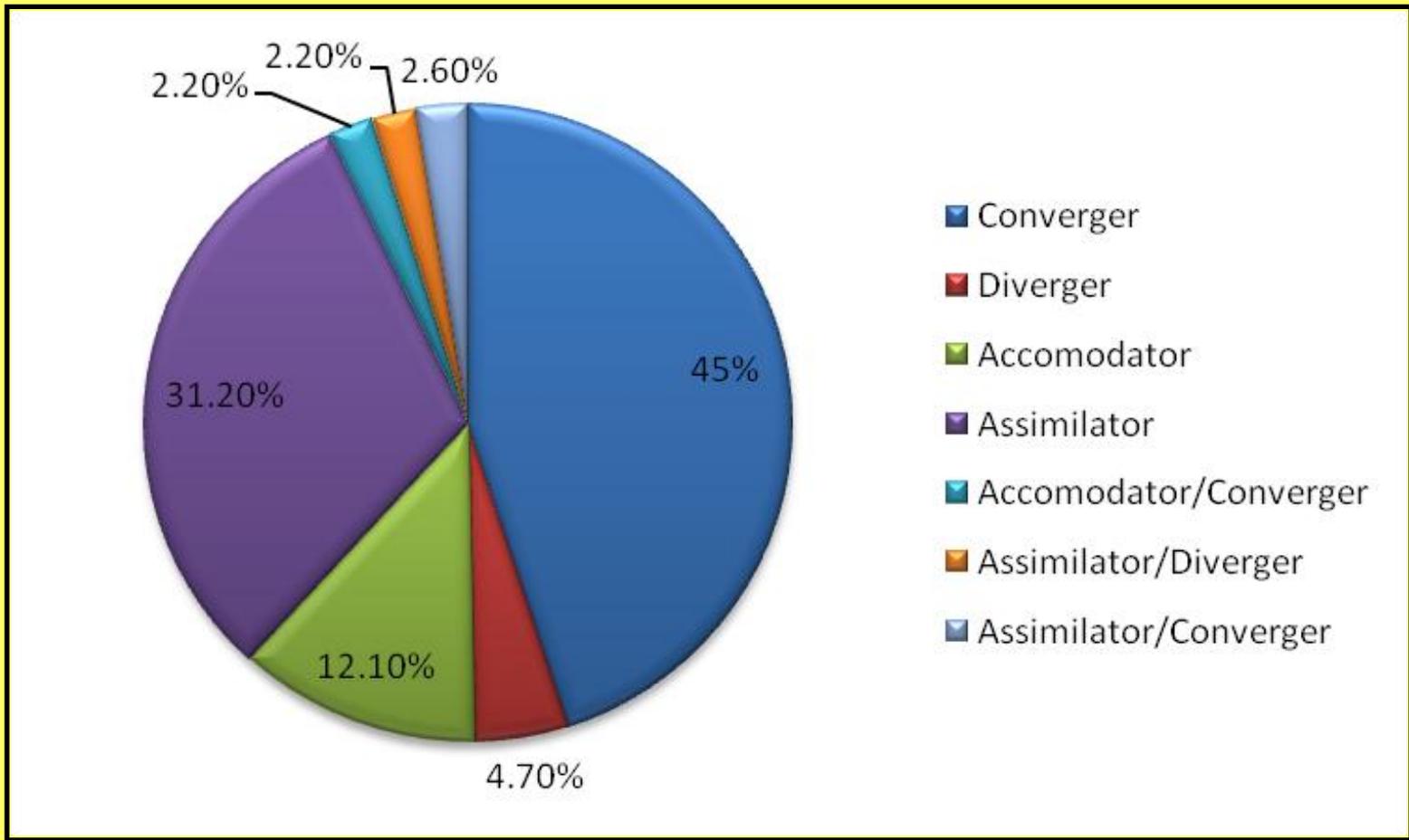
# Results

Learning Styles among Athletic Training Students (n=56)



# Results

Learning Styles among Students from Other Majors (n=233)



# Discussion

## Strengths of Individual Learning Styles

- **Converger**
  - design, decision making, action oriented, evaluating plans
- **Diverger**
  - creativity, generation of alternatives, recognition of problems
- **Assimilator**
  - planning, creating models, formulating theories, defining problems
- **Accomodator**
  - accomplishment, goal oriented, implementing decisions

# Discussion

## Learning Styles of Students by Major

- Dietetics students in this study were predominately convergers or assimilators. This differs from results of a previous study of 324 senior dietetics students in Utah, which indicated that 20.7% were convergers, 29.6% were assimilators, 27.8% were accomodators, and 21.9% were divergers.<sup>2</sup>
- The clear majority of athletic training students in this study were convergers. Previous findings of athletic training students in a classroom setting indicated a very different distribution of learning styles with the majority being assimilators (65.4%), followed by convergers (15.4%), accomodators (10%), and divergers (9.2%).<sup>3</sup>

# Discussion

## Learning Styles of Students by Major

- The majority of exercise science students were convergers, followed by assimilators, accomodators, and divergers. These are the first results of learning style preferences of undergraduate students majoring in exercise science.
- Other students surveyed were from several different majors offered through the universities. However, they were enrolled in health science courses at the time of data collection. The majority of these students were convergers and assimilators.

# Conclusion

- In this study, exercise science and athletic training students preferred the converger learning style while dietetics students were divided between the converger and assimilator learning styles. Understanding preferred learning styles of college students in different academic programs may guide methods of instruction and increase the effectiveness of teaching and learning.
- A limitation of this study included that it consisted of a convenience sample of college students, thereby limiting the generalizability of the results.
- Future research should focus on assessing the preferred learning styles of college students from all applied science majors.

# References

1. Marshall JC, Merritt SL. *Student Learning Style Questionnaire*. 1985.
2. Mitchell AW, Nyland NK. Learning styles differ between senior dietetics students and dietetic faculty members. *J Am Diet Assoc*. 2005;105:1605-1608.
3. Coker CA. Consistency of learning styles of undergraduate athletic training students in the traditional classroom versus the clinical setting. *J Athl Train*. 2000;35(4):441-444.