## Research on the Effectiveness of Anatomy in Clay® Learning System

<table>
<thead>
<tr>
<th>Number</th>
<th>Reference</th>
</tr>
</thead>
</table>


Patel J, Rosentsveg J, Gabbur N, Marquez S. Clay modeling as a haptic model to teach a hysterectomy procedure and pelvic anatomy to obstetrics and gynecology residents. Obstet Gynecol 2014;123:20S.


Reseach on the Effectiveness of Anatomy in Clay® Learning System (cont)

1. "Cat dissection vs. sculpting human structures in clay: an analysis of two approaches to undergraduate human anatomy laboratory education"


Department of Biology, The Pennsylvania State University, University Park Pennsylvania; Department of Educational Psychology, The Pennsylvania State University, University Park Pennsylvania; Life Science Department, Mohawk Valley Community College, Utica, New York

Peer reviewed

CONCLUSION

"...students in the human clay sculpting group scored significantly higher than their classmates ... on both the low- and the high-level questions."

2. Human clay models versus cat dissection: How the similarity between the classroom and the exam affects student performance."

John R. Waters, Peggy Van Meter, William Perrotti, Salvatore Drogo, and Richard J. Cyr

Department of Biology, The Pennsylvania State University, University Park Pennsylvania; Department of educational Psychology, The Pennsylvania State University, University Park Pennsylvania; Life Science Department, Mohawk Valley Community College, Utica, New York

Peer reviewed

CONCLUSION

“Students in the human clay sculpting treatment group performed best on human anatomy questions and students in the cat dissection treatment group performed better on cat anatomy questions (independent of the use of handouts) ... Human representations are most effective when teaching the human muscular system.”
CONCLUSION

Testing showed that the group using clay modeling had a significantly better ability to identify the muscles on their human models compared to the same test performed by students who had learned the material using cat dissection. “This study demonstrated that clay modeling is more effective than cat dissection for learning human muscles at the community college level.”

CONCLUSION

“The current study sought to answer the question: Does the administration of the Anatomy in Clay® Learning System technique assist students in better (1) internalizing and (2) retaining a working knowledge of the human muscular and skeletal systems? The results suggest that the Anatomy in Clay® Learning System process was successful in positively influencing student learning in these areas.”

CONCLUSION

“The Anatomy in Clay® Learning System, developed by Zahourek Systems Inc., provides an alternative to cadaver dissections for the study of anatomy...”
“Learning outcomes and student-perceived value of clay modeling and cat dissection in undergraduate human anatomy and physiology.”

Ellen DeHoff, Krista L Clark, Karthikeyan Meganathan

Science and Health Department, University of Cincinnati Clermont College, Batavia, Ohio

Peer reviewed

CONCLUSION

“Students who modeled anatomic structures in clay scored significantly higher on low-order questions related to peripheral nerves; scores were comparable between groups for high-order questions on peripheral nerves and for questions on muscles and blood vessels.” Evaluative responses from students indicated that clay modeling was preferred by students on a subjective basis regarding the value of their experience.

“Improving understanding of human anatomy using haptic learning through clay modeling.”

Vered Arbel, Adam Rudd, Emily Muszczynski, Meghan Growe, Jane Marone, Mary Lou Bariether

Department of Kinesiology and Nutrition

University of Illinois-Chicago

REPORT

The outcome of the study is in statistical review.

DISCUSSION

The VARK assessment tool for student learning categorizes learning preferences as: Visual (V), Auditory (A), Read/write (R), or Kinesthetic (K). Recognition of anatomy students’ learning preferences may improve teaching effectiveness. Studies suggest that hands-on (haptic) learning using clay modeling helps students learn anatomy. However, it is unknown if this technique is equally effective for students in each VARK category. Therefore, the purpose of the study was to determine if implementing haptic learning through clay modeling would improve student learning and if the degree of improvement varied between learning styles. Forty undergraduate students enrolled in a cadaver dissection course, completed a pre-assessment exam, and a validated learning style survey. Students were divided into three groups: Group A participated in a weekly one-hour class using clay models (Maniken® models); Group B participated in a weekly one-hour class answering written questions on anatomical relationships; Group C (control) studied independently.

All groups completed a post-assessment exam at the end of the course and a retention exam one semester later. We hypothesized that groups A and B would perform better than group C on the post-assessment and retention exams and that K-learners in the haptic group would perform the best overall.
CONCLUSION

The plastic model and non-hardening modeling clay used as a teaching kit is a “more diverse teaching style” for the human musculoskeletal system and is “especially helpful for kinesthetic learners.”

CONCLUSION

“The versatility of the kit makes it useful for teachers at any level ... the lessons are frameworks, not cookbook, and allow for creativity, which is not always the case in other classroom kits. The product is economical because it is reusable. I have found that many times it is difficult for students to grasp the concepts of the traditional Latin and Greek terms. Having the students point out the terminology on the model and on their own body created a connection that a worksheet cannot provide.” “Overall, the Anatomy in Clay® Learning System is one of the best investments I have made for my A&P classroom ... The models really enabled my students to see that their own bodies can be the best learning resource for anatomy.”

CONCLUSION

“The Zoologik™ System of Kinesthetic Anatomy in Clay® Learning System helps students learn anatomy more effectively and retain what they learn longer. The system is based on the principle that students incorporate knowledge better through experiential or kinesthetic learning. What really reinforces the learning of anatomy is when students work with plasticine clay to shape their body structures.”

“Maniken® System Human Anatomy in Clay® Learning System.”
Richard Lord
Journal of College Science Teaching

“Anatomy in Clay® Learning System.”
Chris Monsour, Department Editor
Classroom Materials Reviews

“The Zoologik™ System of Kinesthetic Anatomy in Clay® Learning System.”
Science Activities
"Hands-on Learning using Anatomy in Clay Manikens"

Kelley Whisler

Kansas Career & Technical Education Convention

Friends University

CONCLUSION

“The results of this study indicate that adding the hands-on work with the Manikens to four Anatomy & Physiology Units (Bones, Muscles, Heart and Circulatory System) did improve student learning of anatomy in those units.”