Teaching of the Integrated Morphology

Enseñanza de la Morfología Integrada

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SUMMARY: The changes in the university curriculum have made necessary the vertical and horizontal integration of contents that are taught in morphology sciences. In this study, students of the Morphology and Human Development Module of the cohorts 2006 and 2007 participated. In 2006 the students (n=83) developed the thematic unit of locomotive apparatus in a chronologically and sequentially integrated way. In 2007 (n=102) this same unit was developed in a totally integrated way, in form of learning object from the macroscopic, microscopic and embryology perspectives. A theoretical instrument was designed to evaluate the content of the unit, the approaches of validity and reliability were determined (a=0.79), and then, it was applied to the 2006 and 2007 students. Higher and significant results (p=0.02) were obtained in the group that developed the content by means of integration under the form of learning object, belonging to the cohort 2007. The results indicate that the integration of contents in morphology improves the theoretical learning of them.

KEY WORDS: Integrated morphology; Teaching of Anatomy; Learning; Learning object.

INTRODUCTION

In the last time, the teaching of morphology sciences have advanced towards a bigger integration of their contents.

For Bucarey & Alvarez (2006) the creation of integrated subjects has begun to extend in Chilean Universities, impelled by the accreditation processes to which some of these institutions are undergoing (Rosselot, 2001).

The Gross Anatomy, Microscopy and Embriology, are basic disciplines that have great importance and clinical application, for what their understanding and retention should be viewed making use of all available resources (Guiraldes et al., 2001).

For Rosell et al. (2004) the integrated teaching is a historical necessity of the education that has originated the explosion of the knowledge, and morphology is not away of this necessity.

It is indispensable to establish a work in coordination with the different disciplines that are imparted (Segura et al., 2001), this coordination is favorable in the area of morphology sciences, where the contents can be grouped in learning objects, which are an approach to the development of the mature structure view, in the macroscopic and microscopic level.

From the process of curricular transformation to a model of professional formation competence-based undertaken by the Universidad de Talca, Chile in 2004 and in implementation phase in 2006, the new formative necessities impelled the vertical and horizontal integration of the subjects, of the School of Dentistry of the Faculty of Sciences of Health, modules are being built that they respond in way but they are efficient to the new model of the professional formation of surgeon dentists.

In 2006, when the implementation of the curricular model competences-based in the module of morphology and human development, the students began the revision of the corresponding contents of the gross Anatomy, Microscopy and Embriology in a sequential way and chronologically integrated, but with independent theoretical and practically sessions for each one of the areas of Morphology.

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For the year 2007, once the stage of the implementation of the model has already advanced, the integration of the content were proceeded to carry out, so that the practical and theoretical activities developed by the students referred to a learning object, according to the description by Bucarey & Alvarez. In this way, the learning object corresponded to the study of the axial skeleton, which is it was treated from the macroscopy, the microscopy and the development of these ones in an integrated way.

The objective of this study is to analyze if there are differences in the students academic performances when developing the contents in an integrated way.

**SUBJECTS AND METHOD**

This study was developed in students of Dental School of Universidad de Talca, in which a cohort of students of 2006 class (n = 83) and the cohort of 2007 class (n=102), of the module of Morphology and Human Development took part.

A multiple choice theoretical evaluation instrument of 60 questions was built. Each of the questions presented statements of at least two areas of morphology referred to the thematic unit of locomotive apparatus that included the following contents:

* Osteology (Gross Anatomy)
* Skeletal tissues (Microscopy)
* Arthrology (Gross Anatomy)
* Arthrologic tissues (Microscopy)
* Miology (Gross Anatomy)
* Muscle tissue (Microscopy)
* Locomotive apparatus development.

The thematic unit of locomotive apparatus looks to develop the competence: "To understand the organization of locomotive apparatus of the healthy human body from macroscopy, microscopy and its development perspective, in a level that allows the students to communicate with the members of the team of health in this topic, reinforcing the vision of the dental patient as an integral being."

Starting from this competence, two domains can be analyzed that serve as base for the evaluation:

1. General knowledge of the morphology of the locomotive apparatus.
2. Relationship of the locomotive apparatus with the other systems and the patients in their group.

**Validity and reliability analysis of the instrument.** A validation of the content of the instrument was carried out by judges for the corresponding adaptation, to be applied to a controlled group of assistant students, with the purpose of establishing the internal consistency of the instrument by means of the reliability alpha of Cronbach analysis (a=0.79).

**Data analysis.** The scores obtained by the students allowed the calculation of the qualification by means of the application of a scale that related obtained score with a grade, establishing the 4.0 (60%), as a passing grade, that is to say, the students should have 36 points.

The data was processed with the SPSS 14.0 program and the statistical ones were descriptively calculated. To determine if the observed differences were significant the Mann-Whitney U test was applied, with an interval of trust of 95%.

**RESULTS**

The academic performance is expressed in terms of grades with a 1.00 to 7.00 scale. The main values of the average marks of the applied test in 2006 were of 4.00, while in 2007 were of 4.33. The descriptive statistical of the results of the applied instrument can be shown in the Table I.

In Fig. 1, the box plot shows that the results of the years 2006 and 2007 present a relatively symmetrical distribution, concentrating most around the 4.00.

To determine if the differences observed in the cohorts 2006 and 2007 were significant, the non parametric Mann-Whitney U test was used, the observed ranges and the statistical of contrast for this test can be observed in the Tables II and III.

**DISCUSSION**

The development of integrated curriculum has begun to be a necessity in the medical education. The teaching of morphology presents characteristics that allow it to generate semantic linkings that relate contents seen from the perspectives of macroscopy, microscopy and embryology. In this integration, learning styles (Suazo, 2007) and the students motivation (Cabalin et al., 2002) have an important role in this aspect.

The results analysis allows us to observe significant differences in the results obtained by the students of the cohorts 2006 and 2007, being higher in the students that developed

Diverses authors postulate that the learning should be significant, not only memory, and for this reason, the new knowledge should be related in a vertical way with the previous knowledge that the apprentice possesses and tranverses with other related contents (Ausubel, 1976; Novak & Gowin, 1988).

Lastly, it is necessary to mention that, as in the development of the courses of integrated morphology diverse methodological strategies will be used, the evaluation should also be multidimensional and multinstrumental. The present study observes an apparent advantage of a real integration of the contents of morphology, in forms of learning objects, but referred to an evaluative dimension, being necessary the practical learnings and the development of competence analysis.

REFERENCES


