Research Methodology - Analysis of the movement and new technologies

Giuseppe Baldassarre

The study of motion analysis through the use of new technologies, has obtained in recent decades a notable development although it is still in its primordial stages. The work will deepen the knowledge of new techniques and tools used in the analysis of the movement of humans beings and how they can determine a wide range of surveys aimed at understanding the statics and dynamics of the human body, both in terms of the biomechanical aspects (kinematic and dynamic models muscle-skeletal, motion simulation), and for those related to neural motor control and movement coordination. The use of modern technologies for movement analysis also plays an important role in various areas of medicine and the humanities. In neurophysiology, orthopedics and rehabilitation, these techniques allow a more detailed functional diagnosis and more appropriate treatment. The research and studies in the field of motion analysis can certainly help to provide guidance and represent new lines of study for their applications in education.

The movement activities by their nature are in all fields of interest of mankind, healthy, sporting, recreational, social, representing an educational setting high educational significance and value added to the training of the person.

The work based on experimental research will provide useful information that will join the side of education and psychology of sport, capturing the salient aspects and emotional pressures, with the cognitive, for their full use in an educational environment - training.

The new techniques allow to obtain non-invasively quantified and detailed information about the functionality of our muscle-skeletal system. The new systems such as video cameras or infrared rays, the platforms stabilometric torque and electromyographic systems allow to carry out analyzes multifactorial static, dynamic of the path, through which you can highlight and quantify the alterations of the motor gesture compared to the physiological patterns of movement, asymmetries and anomalous correlations between biomechanical variables and muscle activity.

One of the strengths of these techniques is the ability to be able to compare quantitatively the functional conditions of a patient in the various phases of the study of diseases or rehabilitative treatment. The adoption of techniques and methodologies with objective, repeatable, measurable, comparable and reproducible, can help to overcome the difficulties of interpretation and diagnostic assessment in the different fields of neurophysiological, Orthopedic, Rehabilitation and Performative application.

Studies in the ‘90s of educational psychology and educational type were intended solely to solving problems within educational settings, as many authors claimed (JB Carroll, 1963 D. Ausubel, 1968,

RMW Travers, 1973)[1] showing that school is the privileged backgrounds of educational psychology. Much is due to the theories of authors such as G. Rizzolatti, C. Sinigaglia (2006), H. Gardner (1985), D. Goleman (2001), J. LeDoux (2003), M. Hissing (2002), who, through their studies, expanded this kind of research, providing meaningful responses on cognitive and emotional mechanisms, the physicality and movement, and the amazing capabilities of our brain, opening up new field in teaching and learning processes in school and sport environment.
The neurophysiological approach developed by Donald Hebb has demonstrated a close relationship between emotions and learning, directing a search of the strong stimulus in the educational process.
In fact, his download-connect theory has opened new horizons for education that draws on for the application of new methodologies, experiences and motor body.
In this sense, the activities and sports become a lever for access to knowledge and cross to the educational and training activities of the person.
The work is divided into three parts. In the first part, we traced the history and evolution of the analysis of the movement until now dwelling on issues related to biomedical signals necessary for the collection of information coming from our body. The second part of the work has been devoted to the analysis of the movement and the various branches of medicine in different ways deal with the study of signals emitted by the body and movement, analytically describing the technological equipment in the Laboratory of Movement Analysis' University of Salerno, and their usage. In the latter part of the work we present the experiences and researches carried out with the equipment available during the doctoral and their reflections and conclusions.

[1] Cfr. Filograsso, N., (1990) "Psicologia dell'educazione" in "Atlante della Pedagogia" Vol. 1 Le Idee a cura di Laeng, M., Tecnodid - Napoli