11 - HUMAN FACTORS: PHYSICAL EDUCATOR WORKING IN THE INDUSTRY

SILVA, MARCELO PEREIRA DA
Centro Universitário Positivo UNICENP
LICK, VANDERLEI LUIZ CHRISTOFF
Universidade Federal do Rio Grande do Sul
BALBINOTTI, Giles.
Faculdade Tecnológica Tupi - PR
SEVILIO, MARIO NORBERTO O. Jr.
Universidade Federal de São Paulo
Curitiba - Paraná - Brasil
marcelo.p.silva@renault.com

1- Physical Education as a big area and the human factors in the industry as a possibility of professional working

An enormous group of activities is inside Physical Education besides the sports, as well as all scientific acknowledge that is necessary to study the activities that involve the totality of the human movements. Therefore, there is a possibility there is a great possibility in the job market. The industries are locals that offer possibilities to the Physical Education professional, one of this is the human factors.

The human factors look for a better interaction between the human being and his work ambient, in a way that the work diseases be decreased, including stress and fatigue caused by movements repetitions and also in a way that the productivity be increased. This study will discuss the insertion of the Physical Education in the industry, specially the work in the area of human factors. It is also a desire of this article to discuss if the generalist of the graduation in Physical Education allows the graduate work in this area in a satisfactory way.

Because of the importance of the area, Physical Education was considered an important factor in life, having a lot of factors that conferred characteristics for is professional title and recognizing. The regulation that occurred in September first of 1998, with the federal law 9.696, and in this occasion was created the CONFEF, Physical Education federal council.

To be aware of the size of this area, the twelve biggest sports in Brazil employ about 965 thousand people; only the soccer makes about 150 thousand jobs (CONFEF, 2004). Therefore the people that practice exercises regularly, the area of the Physical Education call our attention because the economic factors, on the years of 1996 and 2000 wile the richness of the country (PIB) increased 2,25%, the same statistic in the sports increased 13% (CONFEF, 2004).

The capacity of the professional of Physic Education allows that the graduate person works in all ways related to the physic activity, in the sportive area and in diverse areas of the human acknowledge, promoting education, encouraging the physic activity, and applying his understanding of physic activity and moving, analyzing them between the human being and the environment.

The job market of the professional of Physic Education is wide and presents diverse positions in the society. The gymnastic centers, popularly called gyms, can be considered as the most frequent alternative of these professionals. Researches show that this have been the choice of a great amount of the graduates, most of them are recently graduated (MELO, 1995).

Even with a great job market the insertion of the Physical Education professional in the industry is small and in this segment, this professional can work with labor gym, physical conditioning of the employees, recreation and leisure and human factors. Of these possibilities is important for this article the human factors, which is the study of the relation between the human being and the work environment.

2- The graduation of the Physical Education professional and his insertion in the job market.

The physical education is more present in the day by day of the people that everybody thinks. It can be seen as: "the group of physical activities, methodic and rational that are involved to the process of global education, looking for the best developing of the locomotion system, and the developing of the vita functions and the better social relationship" (TOSCANO, 1974).

As the study of Hurtado (1988), in our days the Physical Education has occupied new and important spaces on the biological, psychological and physiological areas. Therefore, it appear as one job sectors of responsibility, because the focus on the heath of the human being.

"Brazilian Physical Education, as well the profession of the Physical Education are in moments of transition and changes of paradigms, and became necessary to identify and develop its social, cultural and politics dimensions" (CONFEF, 2002).

Because of this need the CONFEF made the Resolution nº046/2002 that talks about the intervention of the professional graduated in Physical Education, and guarantee by this document that the professional of this area is specialist in the acknowledge of the physical activity and human movement. This professional is capable of attend the different expressions of the human movement. Thus, this professional is capable to develop works in the area of human factors, because his graduation allows to:

Apply methods and techniques to measure the antropometric, biomechanical, movement, functional, physiological and the corporal composition, in labs or in other locals of intervention. The objective is to measure the physical condition of the functional components and the morphological ones and the technical execution of the movements, in a way of orient, prevent and make the rabidity of de condition (…) of the people (CONFEF, 2002).

The curse of Physical Education has the objective the study of Physical Education in biological, behavioral and sociological terms. It is expected from the graduate to have the acknowledge of the techniques and abilities needed for its professional intervention, having this way a solid beginning, making the professional competent to deal with the new challenges of the society, of the job market and of the professional practice (BARROS, apud CONFEF, 2002).

There is a difference in the graduation of the Physical Education professional, because there are colleges that offer major and others that offer bachelor degree. The main subject of major is exclusively the development of physical activities in children education, until high school. Thus, the curricular grades of these curses make a professional capable to act in the school. In the other hand the bachelor, acting according with the new make professionals that can attend in the most different

1- The functions of the muscle-skeletal are of sustain and protect the body and its organ and maintain the movement.
2- Ergonomic: Ergon = work and nomos = rules. At the United States is used the term Human Factors (DULL, 1995, apud BALBINOTI, 2003)
3- Absenteeism is the temporary or permanent incapacity of the worker to do his activities, caused by a disease related to the work.
4- The International Work Organization was created in 1919, having like principal function the divulgation of international information and recommendation that protects the workers. Many conventions and recommendations refers to the security, health and work conditions and do not have any obligatory character, the country decides internally these questions in a regularly way according to the Law all the technical aspects involved (BENITO, 2000).

situations. These professionals are capable to work with human factors.

The curriculum of the curse of Physical Education is organized having as a base isolated disciplines, as for example, from mechanical to sociology, thus, the graduate can be know as a generalist. Because of this formation this professional can act in schools, gyms, and other places that allow the practice of Physical Education.

Because of this general graduation, the professional the Physical Education can work in gyms, schools and other places. However a lot of universities have the desire of offer the biggest number of disciplines as possible in the way of the graduated student be prepared for the most different situations. This can not be seen as a mistake, because this gives to the professional a better and most complete vision of his job.

The curricular grade of Physical Education has disciplines of human area as pedagogy and history, and even disciplines of the health area, as physiology. These are the bases to the development of the work in human factors. For example: the anthropometrical studies the measures of the body segments of the human being, and are others disciplines that study the body movement, as well as neurology, psychology, anatomy and others similar ones that study the body work. Thus, because of this general graduation, the Physical Educator professional can be insert in the industry, in the area of the labor gym but also in human factors.

3- The importance of the Ergonomic and the Actuation Areas

The job is part of the life and is really important to the development of the society and the human beings, on the other hand many situations that happen in the job can be prejudicial to the health, like diseases of the muscle-skeletal system**,** and psychological diseases, like stress. To improve the integration of the man and his work environment, like the mobile and the environment, surged the Ergonomic.

The Ergonomic developed like an area of the human knowledge during the Second World War, when a systematic conjugation of efforts between the technological, human and biological sciences when professionals of these areas worked together to solve problems causes by the operation of complexes military equipment. The results of this effort interdisciplinary had a so great performance that was used by the industry, in the post war (DUL e WEERDMEESTER, 1995). Ergonomic is the study of the adaptation of the work to the human beings characteristics, providing them a comfort, security and good development of the work activities.

"The ergonomic is the scientific study of the relation between the man and his environment, methods and space at the work. The objective is elaborate, with the contribution of many areas and scientific subjects that it is made of, a knowledge that, from a perspective of application should result in a better adaptation to the man of the technological, work and life environment." (International Congress of Ergonomic, 1969 apud BALBINOTI 2003).

The finality of the Ergonomic is to protect the worker against any risk to his health that have the cause on work or conditions that it is made, promote the worker physical and mental adjustment to his activities at the company though the adaptation of the work to the human being and his adjustment in a sector of the company that attends the employee abilities, and contribute to the establishment and maintenance of the higher level of well being mental and physical of the workers.

In 1960, the OIT defined ergonomic as being the "appliance of the biological science with the engineering science to obtain the adjustment of the human being to his work, and assure, at the same time, the efficiency and the well being"..

Grandjean (1998) adds that the ergonomic is a fundamental aspect to be consider in our reality from the moment that interferes directly in certain points like: higher level of work accidents, problems related to diseases of work, lower productivity at the work spaces, like high levels of absenteeism, lower motivation, e interferes as well in the Job Life Quality (JLQ), providing more than a better function, but specially a better like to the worker.

Moraes and Mont'Alvão (2000), affirm that the points that presents ergonomic problems in the industries are showed by human costs from the work to operator, like tiredness, professional diseases, mutilations and deaths. And those accidents, incidents, excessive errors, non-controlled pauses, laziness and other development problems like bad conservation of the machines and equipments. Because of this problems the lower production, waste and the low quality of the products affects the quality and productivities of the companies.

A study realized by the Job International Organization - OIT (MOREIRA, 2003) revels that in Latin America the inconsistent and bad application of laws expose in even 80% the 200 millions of workers of the region to work accidents, with consequences to the health and annual costs approximately US$ 76 billions. That way these problems caused costs to the State, to the company and to the families. It is necessary to act in the prevention of the diseases and factors that prejudices the worker. Still in numbers, the statistics of the Social Security, that is the base to the official information of the Ministry of Work and Job (MTE) in the year 2000, in a total of 26.228.629 workers occurred 287.500 work accidents and 19.134 cases of diseases related to work. Frighten statistics if considered the capacity of prevention of these accidents.

Thus, it are responsibility of the professionals of safety's area and mainly of the area of the health of the companies, to adopt measures seeking to minimize the losses in money with accidents, diseases and the own cost related to the drop of the productivity and, to minimize the workers' suffering.

"The ergonomics contribute to the planning, project and the evaluation of tasks, workstations, products, atmospheres and way systems to turn them compatible with the needs, abilities and the people's" limitations. (ABERGO, 2000). The application of the Ergonomics, while an interdisciplinary approach in the extent of the activity of the work, is essential for the production of more competitive and friendly products and for the improvement of the organizational productivity.

The ergonomics becomes separated in three areas, physics, cognitive and organizational. The physical Ergonomics links with the human anatomy, anthropometrical, physiology and biomechanics in his/her relationship the physical activity. In that area of the ergonomics it is made the study of the posture in the work, handling of materials, repetitive movements, disturbances muscle-skeletal related to the work, workstation project, safety and health.

The cognitive Ergonomics refers to the mental processes, perception, memory, reasoning and motive answer between the man and the system in that it acts, including the study of the mental load of work, socket of decision, stress.

Finally, the organizational Ergonomics studies the optimization of the technical systems, communications, work project, temporary organization of the work, work in-group, participative projects. (ABERGO, 2000)

The strategy used by the Ergonomics to apprehend the complexity of the work is to decompose the activity in observable indicators (posture, visual exploration, displacement). Starting from the results initials obtained and validated with the operators, it is arrived to a synthesis that allows explaining the interrelation of several conditioning to the work situation

The behaviors manifested of the man are frequently observable for the ergonomics, as for instance: the workers' displacements - those can be registered starting from the attendance of the courses accomplished by the operator in his/her workday. The registration of the displacement can explain the importance of other work areas and adjacent areas. Example; in a control room the displacement of the operators to the control panels is related to the exploration of certain visual information that you/they are fundamental for the process control; the displacement even other friends can explain the changes of necessary communications to the work.

4- Conclusion

In the actuality companies are assuming a new thought related with the job market, looking for a great productivity in a low value, what makes the worker have an intense rhythm of work. We notice that the prevention is being adopted and in this view the ergonomic fits, that even the corrective character, presents as a prevention of the occupational diseases. We can affirm that the concern about the ergonomic affects directly in the company's survivor, based on the numbers of IWO, exposed before.

According to what was presented, we can observe the relation between Ergonomic and Physical Education evolves many areas, even though this never affects the Graduation Courses. For a great development of the Physical Education professional can specialize, by using the academicals knowledge.

In Brazil actuality the graduation in Ergonomic is possible only in masters levels in the Specializing courses (called Post Graduation latu sensu). According to the IEA (International Association of Ergonomic), the program of the courses usually includes the fundamental topics in Ergonomic in order to facility the comprehension. This fundamentals topic includes subjects like Psychology, Anatomy and Physiology, Job Organization, Design and methods of Evaluation and Technology of the Information.

The human factors study is multidisciplinary, involving professionals like engineers**,** designers**,** architects, anatomists, physiologists, doctors, physiotherapists and physical education professionals.

The Physical Education professional also work with the skeleton of the human being, teaching new habits and maintaining these right postural habits, working in the lengthening and correcting bad postures.

The person trained and with good physical conditions keeps the correct postures and movements during the day work and have more possibilities of doing the work activities without prejudice the health.

Independent of the Human Factor, an adequate and organized job environment will present low diseases of the muscles**.** This way the ergonomic can contribute on the two factors, human and environmental, and the Physical Education professional can offer good quality of life to the employee thanks to the graduation courses.

It is suggested that the divulgation of the possibilities of inserting the Physical Education professional be done in a more effective way for the market recognize the abilities and all the technical knowledge that the professional have to act in the more diverse areas.

Bibliographical References

ABERGO, 2000. Associação Brasileira de Ergonomia. Site disponível em: http://www.abergo.org.br. Consulta em 29/9/2005.

BALBINOTTI, Giles. Metrópole de São José dos Pinhais. Ano III, nº 428. São José dos Pinhais: 02 de julho de 2003a. **Ergonomia: Palavrão ou solução?**

_____. **Uma metodologia de desdobramento das diretrizes para a questão ergonômica: Um estudo de caso.** Universidade Federal de Santa Catarina. Dissertação de Mestrado, 2003b.

CONFEF. **Carta Brasileira de Educação Física.** Rio de Janeiro:CONFEF, 2000.

_____. **Documento de Intervenção do profissional de Educação Física**. Rio de Janeiro: 2002.

_____. **E.F. Especial.** Órgão Oficial do CONFEF, ano I, edição especial. Agosto 2002.

_____. **E.F**. Órgão Oficial do CONFEF, ano III, nº 11, Março 2004.

DUL, Jan; WEERDMEESTER, Bernard. **Ergonomia Prática**. São Paulo: Edgard Blücher, 2000.

FREDRIKSSON, K.; BILDT, C.; HÄGG, G.; KILBOM, A. **The impact on musculoskeletal disorders of changing physical and psychosocial work environment conditions in the automobile industry.** International Journal of Industrial Ergonomics, 2001.

GRANDJEAN, Etienne. Manual de Ergonomia **Adaptando o Trabalho ao Homem**. 4a ed. Porto Alegre: Bookman, 1998.

GUÉRIN, F.; LAVILLE, A.; DANIELLOU, F.; DURAFFOURG J.; KERGUELEN, A. **Compreender o Trabalho para Transformá-lo A Prática da Ergonomia**. São Paulo: Edgard Blücher, 2001.

HURTADO, Johann. **O ensino da Educação Física, uma abordagem didático-metodológica**. Porto Alegre: Prodil, 1988.

LAVILLE, Antoine. **Ergonomia**. São Paulo: EPU, 1977.

MINISTÉRIO DO TRABALHO E EMPREGO. **Manual de aplicação da Norma Regulamentadora nº 17**. 2a Ed. Brasília: MTE, SIT, 2002.

MELO, Sebastião Iberes Lopes; OELKE, Simone Adriana; TESSARI, Marino. **Determinantes pela procura de cursos de Educação Física e a influência destes na opção profissional do estudante catarinense. Florianópolis**: 1995. Relatório de Pesquisa. CEFID - UDESC.

MORAES, Anamaria de; MONT'ALVÃO, Cláudia. **Ergonomia: Conceitos e Aplicações**. 2a ed., Rio de Janeiro: 2AB editora, 2000.

MOREIRA, Assis. Gazeta Mercantil. Curitiba: 29 de abril de 2003. **US$ 76 bi gastos com acidentes.**

OLIVEIRA, Vitor. **O que é Educação Física**. São Paulo: Brasiliense, 1983.

TOSCANO, Moema. **Teoria da Educação Física brasileira**. Rio de Janeiro: Civilização Brasiléia, 1974.

ZILLI, Cynthia M. **Manual de Cinesioterapia / Ginástica Laboral Uma tarefa interdisciplinar com ação multiprofissional**. São Paulo: Ed. Lovise, 2002.

MARCELO PEREIRA DA SILVA
Rua Jerônimo Durski, 1314, apto26
Curitiba- Paraná CEP 80730 -290
Telefone: 041: 3380 -3761/041: 9634.1226
Email: Marcelo.p.silva@renault.com

HUMAN FACTORS: PHYSICAL EDUCATOR WORKING IN THE INDUSTRY

ABSTRACT

Considering that the profissionalizing in Physical Education is recent, it started in 1998, is necessary identify and develop the abilities of professional insertion. This article intent to discuss the insertion of the Physical Education professional in the industry, especially working at the Ergonomic Area and intent to discuss if the general's subjects of the graduation in this area permits that the graduated act in a satisfactory way at ergonomic which is a multidisciplinary area. We can observe that in the actuality companies are assuming a new thought related with the job market, looking for a great productivity in a low value, what makes the worker have an intense rhythm of work. We notice that the prevention is being adopted and in this view the ergonomic fits, that even the corrective character, presents as a prevention of the occupational diseases.

Key words: professional insertion, Physical Education and human factors.

ERGONOMIE : L'INSERTION DU PROFESSIONNEL EN ÉDUCATION PHYSIQUE DANS L'INDUSTRIE
RESUMÉ

On considère que la professionnalisation en Education physique est récent, une fois que la date de 1998. C'est nécessaire identifier et développer ses possibilités d'insertion professionnelle. L'objective de cette article c'est l'insertion du professionnel en éducation physique dans l'industrie, plutôt avec l'activité d'ergonomie, et de discuter si la formation générique de la graduation en ergonomie permettre le gradué de travailler de façon satisfaisant avec l'ergonomie, métier clairement multidisciplinaire. A été observé que les entreprises vient de adopter dans l'actualité une position par rapport au marché de travail, en cherchant l'augmentation de la productivité avec baisses du coût, l'effet de cette façon d'administrer font que le employé aie une charge plus intense et accéléré de travail. Si a perçoit que la posture de préventions vient d'être adopté et dans cette vision se encadre l'ergonomie, qui malgré d'avoir une vision corrective, si présente plutôt comme prévention à des maladies professionnelles.

Most clés: Insertion professionnelle, éducation physique et ergonomie

ERGONOMÍA: INSERCIÓN PROFESIONAL EN EDUCACIÓN FÍSICA EN LA INDUSTRIA
RESUMEN

Llevando en cuenta que la profesionalización en Educación Física es un nuevo concepto, pues data de 1998, hay necesidad de identificar y desenvolver sus posibilidades de inserción profesional. Este artigo tiene el objetivo de discutir la inserción del profesional de Educación Física en la industria, específicamente trabajando en la área de Ergonomía aunque discutir si la generalidad de la graduación en la área permite que el graduado trabaje de manera satisfactoria con ergonomía, área notablemente multidisciplinar. Se observa que las empresas están asumiendo en los días de hoy una nueva postura relacionada al mercado de trabajo, buscando una gran productividad con un cuesto más bajo, haciendo que el trabajador tenga un ritmo muy intenso de trabajo. Sé percebe que la postura de prevención está siendo adoptada, y en esta visión si encuadra a ergonomía, que a pesar de tener un carácter correctivo, si presenta más como prevención a enfermedades ocupacionales.

Palabras llave: inserción profesional, Educación Física, Ergonomía.

ERGONOMIA: INSERÇÃO DO PROFISSIONAL DE EDUCAÇÃO FÍSICA NA INDÚSTRIA
RESUMO:

Considerando que a profissionalização em Educação Física é recente, pois data de 1998, faz-se necessário identificar e desenvolver suas possibilidades de inserção profissional. Esse artigo visa discutir a inserção do profissional de Educação Física na indústria, especificamente trabalhando na área de ergonomia, e deseja discutir se o generalismo da graduação na área permite que o graduado atue de modo satisfatório com ergonomia, área notadamente multidisciplinar. Observa-se que as empresas vem assumindo na atualidade uma nova postura relacionada ao mercado de trabalho, buscando grande produtividade a um custo menor, o que faz com que o trabalhador tenha um ritmo intenso de trabalho. Percebe-se que a postura de prevenção está sendo adotada, e nessa visão se enquadra a ergonomia, que apesar de ter um caráter corretivo, se apresenta mais como prevenção às doenças ocupacionais.

Palavras Chave: Inserção profissional, Educação Física, ergonomia.