The teaching of physical metallurgy based on the acquisition of soft-skills

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Abstract

For several years now, a lack of interest for metallurgy has appeared among engineering students, particularly in the study of metallic alloys. Teaching this subject therefore requires an evolution towards more adapted teaching methods, no longer focused on the acquisition of knowledge, but also on understanding phenomena by means of practical examples. This teaching method also allows students to acquire a wide range of soft-skills such as written and oral communication, time management, rigour, critical thinking, self-evaluation, ...

To this end, the classes given at the Faculty of Engineering of UMONS at the first year of the Master's degree in Chemistry and Materials Science about metallic alloys (approximately 100 hours), rely on an “inductive” approach of the use of metallic materials: case scenarios, practical exercises to apply the theory, practical lab work, industrial work, plant visits, seminars/conferences, open book oral exam focusing on comprehension.

Specifically, students will have to answer practical questions: “with which metallic material can the body of a car, a bridge, an engine block, a saucepan, a stent, ... be made?” through, for example, the preparation and presentation of lectures (about 15 hours).

During the exercises sessions (6 hours), students are asked to correct the answers of their classmates.

The reports submitted at the end of practical lab works (15 hours) must be adapted to a particular audience (young adolescents, summary report for a colleague, full report for a boss).

About 15 hours are devoted to the analysis by students (alone or in groups of 2) of real industrial cases previously solved by the Metallurgy department and offered to students in the form of project with the writing of a final report that has to be accessible to a non-metallurgist industrial customer.

The plant visits (at least 4 per year) give an illustration of the problems faced by engineers in the metallurgical industry and allow students to meet and discuss with engineers in the field.

The final exam is open book with preliminary preparation by means of a scientific article in English dealing with a subject close to core content of the class.
The skills developed through a good physical education program are critical in ensuring that students have success in many of the sport and leisure activities common to the community. This view is affirmed in the report, Sport Education (Victorian Ministry of Education, 1987), where physical education is characterised as the “foundation stone” on which an effective sport education program can be built. It is the responsibility of the Victorian Department of Education to ensure that students in the formative years, particularly in Years P–3, develop basic physical education skills.

The fundamental motor skill stage are building upon previously learned movements and preparing for the acquisition of more advanced skills. Sequence of Instruction. Acquisition of skill affect performance? The ability of individuals to experience, learn and refine motor skills greatly affects their ability to perform any physical activity. This chapter explores the processes that individuals undertake when learning a new skill and how these processes can be adapted to help individuals learn these skills more easily and quickly.

Chapter 8 | HOW DOES THE ACQUISITION OF SKILL AFFECT PERFORMANCE? 151. Research and Review. 1. Distinguish between the important features. of the cognitive, associative and autonomous stages of skill acquisition. 2. Describe how feedback given to a learner. changes between the cognitive and autonomous stages of skill acquisition. 3. Explain the differences you would see in an. Purchase Physical Metallurgy - 5th Edition. Print Book & E-Book. ISBN 9780444537706, 9780444537713. His research has centered on the investigation of the structure of materials by means of transmission electron microscopy and x-ray diffraction. He has studied various diffusional phase transformations by detailed analysis of their micro-structure as well as electron diffraction patterns. For the past 25 years he has focused on the investigation of the magnetic properties and microstructure of soft magnets (HITPERM), hard magnets (FePt and CoPt) and magnetic thin films for recording media. He co-chairs the Data Storage Systems Center Magnetic Recording Group. Powder Metallurgy 633 17. Failure Analysis Appendix: Temperature-conversion Table Glossary Index inted in Singapore PREFACE The emphasis of the second edition of this text remains on the basic con- cepts and applications of physical metallurgy. The level of this edition is also essentially unchanged. The text is still considered appropriate for the teaching of physical metallurgy to students who are not majors in metallurgy as well as to engineering students as an introductory course. It has also proved useful for technician training pro- grams in industry. The fundamental concepts are still p Physical culture manifests itself through the acquisition of organizational and methodological skills, thanks to which a person can form suitable classes for her personally, their structure and features. At the moment, independent activity in this aspect is the highest form of personal physical education. Physical culture in the life of a modern person allows you to achieve results if a person performs adequate uniform exercises. Loads are selected based on the task. Such can be formulated as the development of its form or the maintenance of the existing one, the restoration of the previous possibilities. Useful physical activity, positively influencing the psychophysical component of a person, is considered to be cultural.