

zorava čitatelje na okruženje, odrednice, mogućnosti i ograničenja Semestra, ali i neke na prvi pogled prikrivene čimbenike koji u značajnoj mjeri određuju njegovo djelovanje. Knjiga je pravo vrelo vrijednih informacija za sve one koji se žele pobliže upoznati s provedbom javnih politika, a svojom zanimljivošću i analitičkim pristupom može poslužiti kao uzor za buduće slične publikacije.

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ROBOTS IN EDUCATION: AN INTRODUCTION TO HIGH-TECH SOCIAL AGENTS, INTELLIGENT TUTORS, AND CURRICULAR TOOLS.

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Introduction

The use of educational technologies to help learn and teach has evolved from computer-aided presentations to educational robots, as the Ozobot and Pepper presented in this book. Many schools and institutions worldwide are already using robots in the classroom. We are witnessing rapid technological advancements. This

progress is due to the term “digitalisation”. The book is written on 238 pages with 49 B/W Illustrations. The book is composed of eleven chapters named: 1. Introduction 2. Theories of Learning 3. The Interactive Mind 4. What Makes a Robot? 5. The Robot as a Tool 6. The Robot as a Social Agent 7. Deployment Requirements 8. Applications 9. Attitudes towards Robots 10. Ethics 11. Research Methods in Educational Robotics. It has a great significance for teachers, students, and society.

Structure of the book

The introduction (Chapter one) outlines the critical themes explored in the following chapters. The book contains valuable guidelines, examples, suggested readings, methodological proposals and fundamental ideas for implementing autonomous technologies in classrooms to support and enhance current and future teachers’ work. On the other hand, it shows how robots can be used to teach and learn in educational environments. The book introduces mechanisms and processes relevant to learning and optimising teaching approaches, particularly those involving robots. It provides an overview of robotics’ technological systems. The book focuses on robots as learning aids. It also emphasizes robots as social agents, assisting as teaching assistants or mentors in learning.

Second chapter, entitled “Theories of learning”, provides an overview of robotics in education. The goal is to introduce fundamental concepts in learning theory and pedagogy. These concepts are required to comprehend educational sciences in human-robot interaction. Learning, according to behaviourism, is the acquisition of new behavioural patterns depending on contextual factors. To counteract the criticisms of the behaviourist approach

to learning, cognitivism proposes a view where mental processes are essential to learning. The constructivist approach to education is founded on Piagetian learning theory. Educational psychologist Benjamin Bloom's studies show that students who receive tutoring outperform their counterparts who receive regular classroom instruction. Project-based Learning sees students as active learners who collaborate to address real-world problems.

The third chapter, entitled "The interactive mind", provides an overview of human learning and teaching characteristics. Developmental psychology explains how an individual's biological, social, emotional, and cognitive dynamics change as they mature and age. Attention as a cognitive mechanism is critical in maintaining task-focused news and is closely linked to the concept of Working Memory (WM). Encoding transforms perceptual data into a form that can be stored and manipulated. Retrieval is the process of discovering and accessing stored data. No learning would be possible without attention and memory functions, as demonstrated by the examples when those are impaired. Living and nonhuman entities alike are naturally endowed with human-like qualities.

The fourth chapter, named "What makes a robot?" discusses how the external power supplies could be used to power educational robots, but this is inefficient, impractical, and possibly dangerous. Speech is one of the most natural and straightforward ways in which humans communicate. Speaking to a machine in one's native language is clear. Computer vision has been used for decades, mainly using image-processing methods. Computer vision has become a vital input source for robots with the advent of digital cameras and increased processing capacity. Robots are likely to confront barriers and things of interest in a dynamic environment. Robots

often have speakers or buzzers for sound. This can help the robot communicate with the pupil, especially if it speaks.

The fifth chapter, called "The Robot as a Tool", points out that Robots have been utilised in education since the 1970s. Students build and program robots to learn about the world and technical concepts. The robots are thus tools, and the learners use them to understand. The use of robots in education stems from improvements in computer programming education, which influences how robots are programmed. Machine programming education teaches computational thinking: the systematic division and solving of problems through phases and procedures that a computer could perform. In addition, the European Commission and business partners promote grassroots initiatives like EU Code Week, which involves hundreds of activities around Europe to introduce children to coding.

The sixth chapter, "The Robot as a Social Agent", discusses how a social robot needs two things: to be embodied in multiple dimensions and to engage emotionally and cognitively with people. While social skills are part of education, it is unclear how a social robot may be used in an educational setting. Robot teaching has been studied in controlled experiments in university laboratories and field trials. For example, the Swiss CoWriter project investigated how children could educate a less capable robot to write. The idea is interesting since it uses a robot to teach fine motor skills. In addition, distance learning is now widely used and allows learners and teachers to attend and teach classes regardless of enormous geographical distances, medical limits, or government restrictions.

The introduction and maintenance of a robotic system in an educational setting are examined in the seventh chapter, called Deployment Requirements. Nowa-

days, 3D-printing technology has become a convenient way to obtain numerous types of basic robots. Programmers need a testing space where robots can roam about freely without obstructions. No person should be responsible for robot development. Team members boost the possibilities of robot applications and hence challenge programmers. Today's digital applications and scenarios necessitate the utilisation of social media. Mobile devices like smartphones or tablets can be used to control a robot, but rarely for their development. Choregraphe's software development environment is written in Python, so researchers and users can program these robots in any Python IDE.

The ninth chapter, called "Application", describes how robots of various types can help human learners acquire or deepen knowledge and skills. Robots can help teach numerous disciplines, such as geography and history. Using robots to teach STEM subjects and computer programming is a well-established practice. The idea of utilising social robots to prepare future teachers for digital issues has lately been extended to secondary school and university teacher training. The Embodied Perceptive Tutors for Empathy-based Learning European project looked at how a robot may help secondary school students. Just put a new conversation database and software onto the robot, and it can teach French or German.

In the eighth chapter, entitled "Attitudes Towards Robots", attitudes are comprehensive judgments of any object. Like any other thing, robots can provoke positive, hostile, or even indifferent responses from potential end-users. Without consenting end users, even the most sophisticated and technologically advanced robots would be useless in industry, households, or classrooms. There has been a lot of research on educational robots and their use,

but little on user attitudes, with most attempts limited to interviews with a small group of users in focus groups. According to the studies presented, teachers and students have differing opinions about instructional robots. The main concerns of teachers affect their personal and professional outcomes.

The tenth chapter, called "Ethics", ethics is the study of the concepts and standards that define good and wrong. Its millennia-long history is rich and diverse, originating from various intuitions about the nature of good and evil. Most applied ethics arguments take a position on either consequentialism or deontology. Either approach establishes prescriptive rules and normative standards to distinguish morally good behaviours or decisions. Following one's "good nature," the positive inclinations ingrained in the moral character lead to good conduct. A robot may not be able to recognise or value a student's ethnicity, gender, tradition, or religion. Because they lack conscious experience, robots are oblivious to the qualitative component of that feeling or the settings of human's experience.

The last chapter is entitled "Research Methods in Educational Robotics". The "Human-Robot Interaction" conference, held in 2006, became the field's flagship event. A quantitative study collects the data by observing participants' behaviour in a lab setting or outside, such as in their schools or families. A competent literature review will summarise previous research and identify knowledge gaps. Educational robotics study could also delve into educational technology literature in order to identify gaps in strategies that do not use robots, but use other intelligent artefacts. Empirical research involves gathering data from individuals. Any statistical analysis seeks to exclude the notion that observed disparities in measurements are

attributable to chance alone.

Importance of the book

The primary value of the book lies in its practical application and form. Many pedagogical and psychological theories are systematised. A book is an excellent resource for teachers of now and tomorrow who want to use autonomous technologies in their classrooms, as the book provides practical recommendations, examples, suggested readings, methodological proposals, and fundamental ideas. It shows how robots can be utilised in educational settings to teach and learn. In this book, you can study the mechanisms and processes involved in learning and teaching, particularly with robots. It gives an overview of robots' technological frameworks. The goal of this book is to use robots as teaching tools. It also emphasises the role of robots as social agents who serve as teaching assistants or mentors in the educational process.

Conclusion

The book provides an approachable introduction to the use of robotics' informal education, covering pedagogical and psychological theories and curriculum implementation. Robots are increasingly used as general classroom tutors, STEM project tools, and study topics. This book examines how educational robots' unique physical and social-interactive abilities can foster student attachments while allowing instructors to focus on their outstanding teaching and learning styles. In addition, the book covers the principles of robotics and related technologies, the attitudes toward and ethical implications of robots in education, and research methodologies pertinent to expanding our understanding of the topic.

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