

Characteristics of the submitted research/ artistic/other output

Name and surname Mgr. Mária Fuchsová, PhD.
Document type: Characteristics of the submitted research/ artistic/other output
The name of the university Comenius University Bratislava
The seat of the university Šafárikovo námestie 6, 818 06 Bratislava

OCA1. - Surname awarded to the assessed person	Fuchsová
OCA2. - Name awarded to the assessed person	Mária
OCA3. - Degrees awarded to the assessed person	Mgr., PhD.
OCA4. - Hyperlink to the entry of the person in the Register of university staff	https://www.portalvs.sk/regzam/detail/5684

1st evaluated output

OCA5.1 - Area of assessment

Preschool and Elementary Pedagogy (1st degree)

OCA6.1 - Category of the research/ artistic/other output

scientific output

OCA7.1 - Year of publication of the research/artistic/other output

2024

OCA8.1 - ID of the record in the Central Registry of Publication Activity (CRPA) or the Central Registry of Artistic Activity (CRAA)

ID:1261395

OCA9.1 - Hyperlink to the record in CRPA or CRAA

<https://app.crepc.sk/?fn=detailBiblioForm&sid=1C98E395077C31135151EF0208CF>

Title of the publication to which the hyperlink points

V1_/ Droščák, Martin (Autor) [UKOPDDPP] (33%) - Fuchsová, Mária (Autor) [UKOPDDPP] (40%) - Rochovská, Ivana (Autor) [UMBPF07] (27%) - Huľová, Zlatica (Recenzent) - Kubiato, Milan (Recenzent) : Inquiry-based primary science education [textový dokument (print)] . – 1. vyd. – London (Veľká Británia) : STS Science Centre ; Brno (Česko) : KEY Publishing, 2024. – 216 s. [12,79 AH] [tlačená forma] : text, fotogr., tab., obr. – ISBN 978-1-908235-30-5

Suggested output quality level

A-

Justification of the RATP

The monograph is published as part of the national project VEGA grant 1/0033/22 "Research-oriented teaching in mathematics, science and technical education". The project dealt with the issue of research-based education in the higher education of primary education teachers. The benefits of research-based education have been confirmed by numerous research studies. However, the need to address the implementation of research-based education in the preparation of future primary education teachers was identified. It is obvious that if students, future teachers, really experience how their prejudices change during research-based activities, how their relationship to science and science education changes during these activities, and how their research competencies change and they acquire scientific work skills, they will be convinced that it makes sense to apply these approaches to their own pedagogical practice.

OCA14.1 - Characteristics of the author's contribution

40% of the author's contribution consisted of an analysis of teaching with a research approach focusing on the competences of university teachers for research activities in the field of living nature (structure and function of the heart, germination and growth of plants, natural community). The analysis of teaching also provides student teachers with a concrete example of how to develop their abilities: 1. introduce students to the issue and justify the implementation of research activities; 2. motivate students to learn; 3. integrate interdisciplinary knowledge and apply interdisciplinary relationships; 4. manage the process of teaching research activities on a scientific basis; 5. draw conclusions from research activities and interpret the course and results of research activities; 6. diagnose the acquired curriculum and 7. respect the different learning styles of students.

OCA16.1 - Annotation of the output in English

The monograph deals with the issue of research-based education in the higher education of primary education teachers. The content of the study is an analysis of teachers' pedagogical practices from the point of view of applying research competencies and identifying the views of student teachers on the research approach in science education at universities in the primary education program. In addition, an analysis of the teacher's research competencies was carried out in the topics 1. Pulley, 2. Structure and function of the heart, 3. Classification of animals, 4. Conditions for plant growth and 5. Natural community of our school. The monograph is primarily intended for experts dealing with the pedagogical theory of primary science education. Its aim is to contribute to knowledge in the field of science education based on the research approach in the higher education of future teachers.

OCA18.1 - Characteristics of the output's impact on socio-economic practice

The monograph deals with the issue of research-based education in the higher education of primary education teachers. The content of the study is an analysis of teachers' pedagogical practices from the point of view of applying research competencies and identifying the views of student teachers on the research approach in scientific education at universities in the primary education program. In addition, an analysis of the teacher's research competencies was carried out in the topics 1. Pulley, 2. Structure and function of the heart, 3. Classification of animals, 4. Conditions for plant growth and 5. Natural community of our school. The monograph is primarily intended for experts dealing with the pedagogical theory of primary science education. Its aim is to contribute to knowledge in the field of scientific education based on the research approach in the higher education of future teachers.

OCA19.1 - Characteristics of the output and related activities' impact on the educational process

The result of the monograph is a specification of research-oriented teaching for students of the primary pedagogy study program. By analyzing teaching with a research approach focusing on the competences of university teachers for research activities, the publication provides a concrete example for student teachers on how to develop their abilities: 1. introduce students to the issue and justify the implementation of research activities; 2. motivate students to learn; 3. integrate interdisciplinary knowledge and apply interdisciplinary relationships; 4. manage the process of teaching research activities on a scientific basis; 5. draw conclusions from research activities and interpret the course and results of research activities; 6. diagnose the acquired curriculum and 7. respect the different learning styles of students. The research confirmed that the research approach in undergraduate teacher training has proven to be effective. Students have acquired relevant knowledge, skills and competences for inquiry-based teaching and this approach can be applied further. It can be expected that students will also apply the inquiry-based approach in their future teaching practice.

2nd evaluated output

OCA5.2 - Area of assessment

Preschool and Elementary Pedagogy (1st degree)

OCA6.2 - Category of the research/ artistic/other output

scientific output

OCA7.2 - Year of publication of the research/artistic/other output

2024

OCA8.2 - ID of the record in the Central Registry of Publication Activity (CRPA) or the Central Registry of Artistic Activity (CRAA)

ID: 1272869

OCA9.2 - Hyperlink to the record in CRPA or CRAA

<https://app.crepc.sk/?fn=detailBiblioForm&sid=5C148BAA13C74FFF356F9F0C6832>

Title of the publication to which the hyperlink points

V3_/ Fuchsová, Mária (Autor) [UKOPDDPP] (70%) - Bundová, Lucia (Autor) [UKOPDPEP] (15%) - Osad'án, Róbert (Autor) [UKOPDPEP] (15%): Attitudes of future primary education teachers towards the use of augmented reality mobile technologies in the teaching of human biology. – text, tab., obr. – [recenzované]. – ERIH PLUS ; Nordic list ; OA. In: Ad alta [textový dokument (print)] [elektronický dokument] : journal of interdisciplinary research. – Hradec Králové (Česko) : Magnanimitas akademické sdružení. – ISSN 1804-7890. – ISSN (online) 2464-6733. – Roč. 14, č. 2 (2024), s. 101-107 [tlačená forma] [online]

Suggested output quality level

Justification of the RATP

The scientific study is a partial output of the national projects KEGA grant 026UK-4/2022 "Concept of constructionism and augmented reality in STEM education (CEPENSAR)" and VEGA grant 1/0033/22 "Research-oriented teaching in mathematics, science and technology education". The study is therefore based on the issue of research-based education in the higher education of primary education teachers, while the research activities using augmented reality methods were based on the interdisciplinary approach of STEM education. The study of science and technology and the support of critical thinking are important for the development of the whole society. Nowadays, there is a social need to improve the teaching of science and technology subjects in the context of STEM education at every level, from pre-primary to university. The aim of the study is therefore to implement the phenomenon of augmented reality into constructionist-oriented education.

OCA14.2 - Characteristics of the author's contribution

The 70% contribution of the author consisted in the design and implementation of research-oriented activities using augmented reality methods, which were based on the interdisciplinary approach to STEM education. The author's contribution included a subsequent analysis of research on the attitudes of future teachers towards the use of modern technologies, which affect the possibility of implementing new methods in primary education.

OCA16.2 - Annotation of the output in English

Technological progress affects various areas of life, such as the economy, healthcare or education, which inevitably requires that experts from the given fields adapt to the given changes. New technologies with modern teaching methods in education are often motivating and attractive for students. We therefore consider it important that new teaching methods using modern technologies be part of the preparation of students for their future teaching profession. The attitudes of future teachers towards the use of modern technologies affect the possibility of implementing new methods in primary education. However, the correct and appropriate implementation of modern technologies in education necessarily depends on the students' previous knowledge and experience with the given subject topic in which modern technologies can be used. The introduction of modern technologies into the teaching of future primary education teachers therefore necessarily requires a sufficient understanding of the content of the subject in which the given technology will be implemented.

OCA18.2 - Characteristics of the output's impact on socio-economic practice

Technological progress affects various areas of life, such as the economy, healthcare or education, which necessarily requires experts from the given fields to adapt to the given changes. New technologies with modern teaching methods in education are often motivating and attractive for students. We therefore consider it important that new teaching methods using modern technologies be part of the preparation of students for their future teaching profession. The attitudes of future teachers towards the use of modern technologies affect the possibility of implementing new methods in primary education. However, the correct and appropriate implementation of modern technologies in education necessarily depends on the students' prior knowledge and experience with the given subject topic in which modern technologies can be used. Therefore, the introduction of modern technologies into the teaching of future primary education teachers necessarily requires a sufficient understanding of the content of the subject in which the given technology will be implemented.

OCA19.2 - Characteristics of the output and related activities' impact on the educational process

The study confirmed that teaching biology using modern digital technologies is more motivating for student teachers. In addition, the augmented reality method brings visualization of abstract concepts, which makes it easier to remember more complex biological structures and explain physiological relationships. The research also pointed out the possibilities of using specific digital technology in primary science education, while revealing the limits that new technology brings in science teaching. As part of the research, students strengthened their digital skills, which they will use in future pedagogical practice.

3rd evaluated output

OCA5.3 - Area of assessment

Preschool and Elementary Pedagogy (1st degree)

OCA6.3 - Category of the research/ artistic/other output

scientific output

OCA7.3 - Year of publication of the research/artistic/other output

2019

OCA8.3 - ID of the record in the Central Registry of Publication Activity (CRPA) or the Central Registry of Artistic Activity (CRAA)

ID: 117987

OCA9.3 - Hyperlink to the record in CRPA or CRAA

<https://app.crepc.sk/?fn=detailBiblioForm&sid=3D317B62F21FC1F8086CA5D51B>

Title of the publication to which the hyperlink points

ADN_/ Fuchsová, Mária (Autor) [UKOPDDPP] (50%) - Koreňová, Lilla (Autor) [UKOPDDPP] (50%): Visualisation in basic science and engineering education of future primary school teachers in human biology education using augmented reality. – text, tab., obr. – DOI 10.13187/ejced.2019.1.92. – SCO ; WOS CC ; ESCI. In: European journal of contemporary education [textový dokument (print)] [elektronický dokument] . – Bratislava (Slovensko) : Academic Publishing House Researcher. – ISSN 2304-9650. – ISSN (online) 2305-6746. – Roč. 8, č. 1 (2019), s. 92-102 [tlačená forma] [online]

Suggested output quality level

A+

Justification of the RATP

The study is a partial output of the national project KEGA grant U12UK-4/2018 entitled "Concept of constructionism and augmented reality in the natural science and technical field of primary education (CEPENSAR)". Nowadays, there is a social need to improve the teaching of natural science and technical subjects in primary education in accordance with the new State Educational Program, in the context of social constructionism and current trends in the application of digital technologies in teaching with an emphasis on the phenomenon of augmented reality. The addition of augmented reality, which we evaluate in the study, allowed for a better understanding of the contents of several natural science and technical topics, and thus also supported the development of students' critical and evaluative thinking.

OCA14.3 - Characteristics of the author's contribution

The 50% share of the author's contribution consisted in the design and implementation of activities using augmented reality methods based on constructivist concepts and the subsequent qualitative analysis of the impact of modern digital technologies on the way of students' critical thinking and cooperation in learning complex biological concepts and understanding mutual physiological relationships.

OCA16.3 - Annotation of the output in English

Pedagogical practice confirms that new technologies with modern teaching methods should be implemented already in the university training of future primary education teachers. These technologies contribute to the attractiveness of the study and bring students greater motivation to understand the concepts. The main focus of this study is visualization in education in the field of natural and technical sciences using augmented reality in the context of teaching biology based on constructivist concepts. The study focuses on the perception of this method by future teachers at the first level of primary schools who will teach biology as one of the areas of primary education. Last but not least, the work brings an example of the use of augmented reality applications with biological themes, which appear to be interesting, enriching and beneficial in the context of teaching biology. The conclusions of the study confirmed that the use of modern technology methods in education leads to a deeper understanding of complex concepts and students' motivation to learn increases. The students were motivated by the new method, they collaborated very well, and the learning was constructive.

OCA17.3 - List of maximum 5 most significant citations corresponding to the output

2025 [01/20] / CHE - Czok, Valerie - Weitzel, Holger. Impact of Augmented Reality and game-based learning for science teaching [elektronický dokument]: lessons from pre-service teachers. DOI 10.3390/app15052844. In: Applied sciences. Bazilej: Multidisciplinary Digital Publishing Institute, 2025, Roč. 15, č. 5, art. no. 2844, s. [1-24] [online]. ISSN (online) 2076-3417. - WOS CC ; CCC ; SCO ; OA, s. 1

2025 [01/20] / GBR - Kazmierczak, Rafal - Grunwald, Grzegorz - Skowronski, Robert - Kazmierczak, Lena - Kowalczyk, Cezary. Augmented reality tools for mathematics and geoscience education [elektronický dokument]. DOI 10.1038/s41598-025-02090-z In: Scientific reports. Londýn: Springer Nature. Nature Publishing Group, 2025, Roč. 15, č. 1, art. no. 17129, s. [1-16] [online]. ISSN (online) 2045-2322. - SCO ; WOS CC ; CCC ; OA, s. 2

2025 [01/20] / CHE - Montero-Izquierdo, Ana Isabel - Jeong, Jin Su - Gonzalez-Gomez, David. Augmented reality 3D multibase blocks at the future classroom lab through active methodology [elektronický dokument]: analyzing pre-service teachers' disposition in mathematics course. DOI 10.3390/educsci15080954 In: Education sciences. Bazilej: Multidisciplinary Digital Publishing Institute, 2025, Roč. 15, č. 8, art. no. 954, s. [1-19] [online]. ISSN (online) 2227-7102. - WOS CC ; ESCI, s. 4,13

2025 [01/20] / USA - Parlar, Büsra - Sütcü, Selim Soner. The effects of Augmented Reality in situated English language learning [elektronický dokument]. DOI 10.1111/jcal.70041 In: Journal of Computer Assisted Learning. Hoboken: John Wiley & Sons. Wiley-Blackwell, 2025, Roč. 41, č. 3, art. no. e70041, s. [1-15] [tlačená forma] [online]. ISSN 0266-4909. ISSN (online) 1365-2729. - SCO ; WOS CC ; CCC ; OA, s. 1

2024 [01/20] / USA - Aldeeb, Fatimah H. - Sallabi, Omar M. - Elaish, Monther M. - Hwang, Gwo-Jen. Enhancing students' learning achievements, self-efficacy, and motivation using mobile augmented reality [elektronický dokument]. DOI 10.1111/jcal.12989 In: Journal of Computer Assisted Learning. Hoboken: John Wiley & Sons. Wiley-Blackwell, 2024, Roč. 40, č. 4, s. 1823-1837 [tlačená forma] [online]. ISSN 0266-4909. ISSN (online) 1365-2729. - WOS CC ; SSCI, s. 1823 - 1837

OCA18.3 - Characteristics of the output's impact on socio-economic practice

Pedagogical practice confirms that new technologies with modern teaching methods should be implemented already in the university training of future primary education teachers. These technologies contribute to the attractiveness of the study and bring students greater motivation to understand concepts. The main focus of this study is visualization in education in the field of natural and technical sciences using augmented reality in the context of teaching biology based on constructivist concepts. The study focuses on the perception of this method by future teachers at the first stage of primary schools who will teach biology as one of the areas of primary education. Last but not least, the work brings an example of the use of augmented reality applications with biological themes, which appear to be interesting, enriching and beneficial in the context of teaching biology. The conclusions of the study confirmed that the use of modern technology methods in education leads to a deeper understanding of complex concepts and students' motivation to learn increases. The students were motivated by the new method, they collaborated very well, and the learning was constructive.

OCA19.3 - Characteristics of the output and related activities' impact on the educational process

A study focused on the use of mobile technologies, manipulative activities and visualization in science education using constructivist concepts confirmed higher student motivation to learn. The application of the modern method of augmented reality in education strengthens the understanding of complex concepts, students are creative, cooperate very well and learning becomes constructive. The study confirmed that teaching biology using modern digital technologies is more motivating for student teachers. The method of augmented reality brings visualization of abstract concepts, which makes it easier to remember more complex biological structures and explain physiological relationships. As part of the research, students strengthened their digital skills, which they will use in future pedagogical practice.

4th evaluated output

OCA5.4 - Area of assessment

Preschool and Elementary Pedagogy (1st degree)

OCA6.4 - Category of the research/ artistic/other output

scientific output

OCA7.4 - Year of publication of the research/artistic/other output

2020

OCA8.4 - ID of the record in the Central Registry of Publication Activity (CRPA) or the Central Registry of Artistic Activity (CRAA)

ID: 167109

OCA9.4 - Hyperlink to the record in CRPA or CRAA

<https://app.crepc.sk/?fn=detailBiblioForm&sid=780C5DA7522A72A29CF99DC9C0>

Title of the publication to which the hyperlink points

AEC_/ Fuchsová, Mária (Autor) [UKOPDDPP] (55%) - Adamková, Miriam (Autor) (25%) - Pirháčová Lapšanská, Miroslava (Autor) (20%): Uses of augmented reality in biology education. – text, tab., obr. – [recenzované]. – DOI 10.1163/9789004408845_008. – WOS CC ; SCO. In: Augmented reality in educational settings [textový dokument (print)] [elektronický dokument] / Prodromou, Theodosia [Zostavovateľ, editor]. – 1. vyd. – Leiden (Holandsko) : Brill, 2020. – ISBN 978-90-04-40883-8. – ISBN 978-90-04-40882-1. – ISBN 978-90-04-40884-5, s. 168-194 [tlačaná forma] [online]

Suggested output quality level

A+

Justification of the RATP

The study is a partial output of the national project KEGA grant U12UK-4/2018 entitled "Concept of constructionism and augmented reality in the natural science and technical field of primary education (CEPENSAR)". The project is focused on the possibilities of solving the below-average results obtained by Slovak students in international measurements of natural science literacy, and is also highly topical in view of the general statements of the low level of technical education of our children and youth, which implies a social need to improve the teaching of natural science and technical subjects in primary education in the context of social constructionism and current trends in the application of digital technologies in teaching. The addition of augmented reality, which we evaluate in the study, has enabled a better understanding of the content of several natural science and technical topics, and thus also to support the development of students' critical and evaluative thinking.

OCA14.4 - Characteristics of the author's contribution

The share of 55% of the author's contribution consisted in the analysis of the issue of the use of digital technologies in teaching at various levels, from primary education to university training of students, future teachers of primary education. The analysis includes an overview of the latest freely available applications of augmented reality, whose functions seem to be interesting and beneficial in the context of teaching biology at various levels. Last but not least, the author's contribution includes the design, implementation of activities using methods of augmented reality based on constructivist concepts and the subsequent analysis of the impact of the given technology on the way of critical thinking and cooperation of students in learning complex biological concepts and understanding mutual physiological relationships.

OCA16.4 - Annotation of the output in English

One of the options to increase the attractiveness of STEM subjects among children and students, the future workforce from generations Z and Alpha, is to use various innovative and engaging methods in teaching STEM subjects. Information technologies provide us with many opportunities in the field of education, one of which is augmented reality. The quantitative results of the study indicate that educational systems based on augmented reality successfully stimulate positive emotions and improve students' learning outcomes. In addition, augmented reality technology supports students in a comprehensive understanding of the essence of a subject such as biology. Based on the experiments of previous authors, we believe that augmented reality can be used in the field of anatomy, morphology and physiology of humans, animals or plants, not only in secondary education, but also in primary education.

OCA17.4 - List of maximum 5 most significant citations corresponding to the output

2024 [01/20] / GBR - Koreňová, Lilla - Gunčaga, Ján - Žilková, Katarína - Totkovičová, Martina. A ugmented Reality for exploring solids [elektronický dokument]: a study on improving pre-service teachers . DOI 10.34190/ecel.23.1.2892 In: Proceedings of the 23rd European Conference on e-Learning - ECEL 2024. Reading: Academic Conferences International Limited, 2024, s. 187-196 [tlačená forma] [online]. ISBN 978-1-917204-21-7. ISBN (online) 978-1-917204-22-4. - WOS CC ; CPCI-S ; CPCI-SSH ; SCO, s. 189

2023 [01/20] / NLD - Marin-Marin, Jose-Antonio - Lopez-Belmonte, Jesus - Pozo-Sanchez, Santiago - Moreno-Guerrero, Antonio-Jose. Attitudes towards the development of good practices with augmented reality in secondary education teachers in Spain [elektronický dokument]. DOI 10.1007/s10758-023-09671-9 . In: Technology, Knowledge and Learning. [s.l.]: Springer Nature. Springer International Publishing AG, 2023, Roč. 28, č 4, s. 1443-1459. ISSN 2211-1662. ISSN (online) 2211-1670. - WOS CC ; ESCI, s. 1443 - 1459

2021 [01/20] / CHE - Fraile-Fernandez, Fernando J. - Martinez-Garcia, Rebeca - Castejon-Limas, Manuel. Constructionist learning tool for acquiring skills in understanding standardised engineering drawings of mechanical assemblies in mobile devices [elektronický dokument]. DOI 10.3390/su13063305 In: Sustainability. Bazilej: Multidisciplinary Digital Publishing Institute, 2021, Roč. 13, č. 6, art. no. 3305, s. [1-31] [online]. ISSN (online) 2071-1050. - WOS CC ; SCO ; CCC, s. [1 - 31]

2021 [03/12] / ESP - Koreňová, Lilla - Zemanová, Renáta - Gašparová, Eva. Building mathematical images in frame of distance learning at kindergarten due to COVID-19 pandemic. DOI 10.21125/edulearn.2021.2509. In: EDULEARN21: 13th annual International Conference on Education and New Learning Technologies, Barcelona, 5th - 6th of July, 2021. Barcelona: IATED, 2021, s. 12015-12024 [CD-ROM] [USB kľúč]. ISBN 978-84-09-31267-2. ISSN 2340-1117. - WOS CC, s. 12015 - 12024

2020 [01/12] / GBR - Baran, Bahar - Kaptanoğlu, Şirin Nur - Esen, Erol - Siyez, Diğdem Müge. R eproductive System Augmented Reality Application for Sexual Health Classes [elektronický dokument]. DOI 10.1080/19317611.2020.1825028 In: International journal of sexual health: official journal of the World Association for Sexual Health. Abingdon: Taylor & Francis Group. Routledge, 2020, Roč. 32, č. 4, 408-420 [tlačená forma] [online]. ISSN 1931-7611. ISSN (online) 1931-762X. - SCO ; WOS CC, s. 408 - 420

OCA18.4 - Characteristics of the output's impact on socio-economic practice

One of the ways to increase the attractiveness of STEM subjects among children and students, the future workforce of Generations Z and Alpha, is to use various innovative and engaging methods in teaching STEM subjects. Information technologies provide us with many opportunities in the field of education, one of which is augmented reality. The quantitative results of the study indicate that educational systems based on augmented reality successfully stimulate positive emotions and improve students' learning outcomes. In addition, augmented reality technology supports students in a comprehensive understanding of the essence of a subject such as biology. Based on the experiments of previous authors, we believe that augmented reality can be used in the field of anatomy, morphology and physiology of humans, animals or plants, not only in secondary education, but also in primary education.

OCA19.4 - Characteristics of the output and related activities' impact on the educational process

The study focuses on students' awareness of augmented reality applications, their engagement in the use of new modern technology, as well as their attitude and willingness to use and incorporate them into education, taking into account the developmental stages of children's thinking. The work provides an overview of the latest freely available augmented reality applications, whose functions seem to be interesting and beneficial in the context of biology teaching at different levels.

5th evaluated output

OCA5.5 - Area of assessment

Preschool and Elementary Pedagogy (1st degree)

OCA6.5 - Category of the research/ artistic/other output

pedagogical output

OCA7.5 - Year of publication of the research/artistic/other output

2020

OCA8.5 - ID of the record in the Central Registry of Publication Activity (CRPA) or the Central Registry of Artistic Activity (CRAA)

ID: 229326

OCA9.5 - Hyperlink to the record in CRPA or CRAA

<https://app.crepc.sk/?fn=detailBiblioForm&sid=50EC99C9FF9B848B37F36D41C5>

Title of the publication to which the hyperlink points

ACB_/ Fuchsová, Mária (Author) [UKOPDDPP] (100%) - Beňuš, Radoslav (Reviewer) - Ferková, Štefánia (Reviewer) : Somatic development of the child and its disorders using modern educational technologies [text document (print)] . – 1st ed. – Bratislava (Slovakia) : Comenius University in Bratislava, 2020. – 145 p. [6.83 AH] [printed form] : text, tables. – ISBN 978-80-223-4812-6

Suggested output quality level

B

Justification of the RATP

The university textbook "Somatic development of a child and its disorders using modern educational technologies" was created with the support of grants and is also a partial output of the projects KEGA012UK-4/2018 "Concept of constructionism and augmented reality in the natural science and technical field of primary education (CEPENSAR)", KEGA 049UK-4/2019 "Possibilities and limits of integrated/inclusive education of pupils with sensory disabilities" and VEGA 1/0582/18 "Identification, analysis and description of special educational needs of individuals with health disabilities in productive age in the process of objective and subjective evaluation of their further education options in Slovakia - research analysis". The textbook offers teaching content for subjects focused on the physiological and pathological growth and development of the child's organism, which serves as a biological basis for students of teaching specialization, future teachers, or special educators working in elementary schools and kindergartens.

OCA14.5 - Characteristics of the author's contribution

The share of 100% of the author's contribution consisted in the analysis of the issue of physiological and pathological growth and development of children as part of the biological basis for the education of teachers of primary and special pedagogical education. Part of the author's contribution is the design of activities that make the issue accessible through modern educational technologies in the form of mobile applications that allow students to better understand the concepts and phenomena of more complex anatomical and physiological processes taking place in the developing child's organism.

OCA16.5 - Annotation of the output in English

The university textbook emphasizes the importance of children's somatic development for the preparation of future teachers with a pedagogical focus. The publication contributes to increasing the professional competences of teachers, supports the connection of theoretical knowledge with practice and increases the quality of education in the field of biology and pedagogy. The inclusion of examples of the use of modern technologies (interactive visualizations, digital models and applications) allows for more effective communication of complex biological concepts and relationships, thereby increasing the attractiveness and accessibility of education. The output processed in this way has a direct impact on improving the quality of the teaching process, supporting innovative approaches and, on a broader scale, on the preparation of a qualified workforce in the field of education.

OCA18.5 - Characteristics of the output's impact on socio-economic practice

The university textbook emphasizes the importance of children's somatic development for the preparation of future teachers with a pedagogical specialization. The publication contributes to increasing the professional competences of teachers, supports the connection of theoretical knowledge with practice and increases the quality of education in the field of biology and pedagogy. The inclusion of examples of the use of modern technologies (interactive visualizations, digital models and applications) allows for more effective communication of complex biological concepts and relationships, thereby increasing the attractiveness and accessibility of education. The output processed in this way has a direct impact on improving the quality of the teaching process, supporting innovative approaches and, on a broader scale, on the preparation of a qualified workforce in the field of education.

OCA19.5 - Characteristics of the output and related activities' impact on the educational process

The presented university textbook is intended for students of pedagogical specialization, future teachers of primary and kindergarten schools and special primary and kindergarten schools. The study issues are made accessible through modern educational technologies in the form of mobile applications, which allow students to better understand the concepts and phenomena of more complex anatomical and physiological processes taking place in the developing child's organism.

Date of last update

07.10.2025