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U ovom broju. . .

Causes of the Shortage of Physics Teachers in Croatia

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Ivana Poljančić Beljan koautorica je članka "Causes of the Shortage of Physics Teachers in Croatia", objavljenog u časopisu Education Sciences (Q1), DOI:10.3390/educsci13080788. Prva i glavna autorica članka je Nataša Erceg. Glavni cilj članka jest da rezultati istraživanja postanu temelj za buduće političke odluke koje mogu dovesti do boljih rezultata u rješavanju problema nedostatka nastavnika fizike u Hrvatskoj. Rad je dostupan kroz otvoreni pristup.

Sažetak: Knowing the causes of the shortage of physics teachers in primary and secondary schools is necessary for the development of effective educational policies because the shortage of physics teachers is a global and persistent problem with negative consequences for the quality of education, but also for the survival of the physics profession as a whole. The aim of this study was to investigate, for the first time, the opinions of Croatian physics teachers on the causes of the deficit in their profession. For this purpose, we conducted a descriptive cross-sectional study using an online surveywith Likert-type items and a constructed response item. A total of 390 respondents from all over Croatia participated in the survey, which is 29% of the total population of Croatian physics teachers in the 2022/2023 school year. According to their opinion, the causes of the shortage of Croatian physics teachers are related to the following: lack of incentives and support from the relevant institutions and bodies, the inadequacy of physics content in the curricula, the lack of motivation and negative attitude of students towards physics, impeded professional development, unequal opportunities, and challenges such as excessive workload. The results obtained provide a concrete basis for the development of an effective policy to solve the problem of the physics teacher shortage in Croatia and beyond by governments, universities, and schools.

Fourth Annual Conference of COST Action CA18108

Od 11. do 14. srpnja na Fakultetu za fiziku održana je međunarodna konferencija 4th Annual Conference of COST Action CA18108 "Quantum gravity phenomenology in the multi-messenger approach". Ujedno je to bilo posljednje događanje u sklopu ove COST Akcije. Konferencija je okupila oko 90 sudionika. Reakcije su bile vrlo pozitivne. Lokalni organizacijski odbor: Tomislav Terzić, Dijana Dominis Prester, Marina Manganaro, Jelena Strišković, Dijana Pavlović, Filip Reščić, Anna Campoy Ordaz, Franjo Podobnik, Luka Blažević, Filip Pavun. Održavanje konferencije popraćeno je člankom u Novom listu.

Table 1. Causes of the shortage of physics teachers in Croatia.

The Shortage of Physics Teachers in Croatia is Due to the Following Factors:	*Strongly Disagree*	*Disagree*	*Neither Agree nor Disagree*	*Agree*	*Strongly Agree*
INCENTIVES					
1. The salary is low.	0.8%	2.6%	19.2%	28.7%	48.7%
2. There is a lack of incentives (scholarships, favorable loans, funding for postgraduate studies, etc.).	4.4%	2.8%	21.3%	29.0%	42.6%
3. The salaries of physics teachers are unfairly equal to those of teachers of other subjects, even though the study of physics is more demanding than many other subjects.	9.7%	5.6%	22.8%	24.1%	37.7%
SUPPORT					
4. School administration support is insufficient.	13.8%	17.7%	33.8%	16.9%	17.7%
5. The support of the school founder is insufficient.	6.2%	9.5%	29.5%	25.1%	29.7%
6. Education and Teacher Training Agency support is insufficient.	3.8%	8.5%	27.4%	26.7%	33.6%
7. University support is insufficient.	7.2%	15.9%	41.3%	18.2%	17.4%
8. There is no clear and effective strategy of the Ministry for the employment of physics teachers.	3.1%	2.3%	13.6%	21.5%	59.5%
9. There is no clear and effective strategy of the Ministry for the retention of physics teachers in their profession.	1.5%	0.8%	7.9%	17.9%	71.8%
10. Professional association support is insufficient.	3.8%	7.2%	32.3%	29.0%	27.7%
11. There is a lack of material resources for teaching physics—cabinets, practicums, technical support, etc.	3.3%	7.2%	14.9%	24.9%	49.7%
CONTENT OF THE PHYSICS COURSE					
12. Physics has a mathematical background that is too demanding.	26.7%	24.4%	29.5%	13.6%	5.9%
13. Physics is difficult to teach.	24.9%	19.5%	22.3%	21.3%	12.1%
14. Physics is more abstract than other school subjects.	16.2%	15.1%	23.6%	30.8%	14.4%
15. In textbook examples with physics content, the subjects are mostly men, so it is mostly men who choose careers in physics.	56.2%	17.4%	22.3%	3.6%	0.5%
16. University study programs for the education of future elementary school physics teachers are too demanding.	17.2%	16.9%	29.5%	23.6%	12.8%
17. University study programs for the education of future high school physics teachers are too demanding.	17.7%	18.5%	29.5%	21.8%	12.6%
MOTIVATION					
18. There are too few physicists who are popular with the public and are role models for young people.	7.2%	10.0%	23.3%	33.6%	25.9%
19. Teaching physics is boring.	82.3%	12.1%	4.1%	0.8%	0.8%
20. Physics teachers work with too little enthusiasm, so they do not inspire students to learn physics.	36.9%	24.4%	26.9%	9.5%	2.3%
21. Students' first experiences with physics classes are poor and demotivate them to continue learning physics.	18.5%	17.9%	34.4%	22.8%	6.4%
ATTITUDES					
22. The profession of physics teacher is suitable for women.	34.1%	6.7%	25.1%	5.4%	28.7%
23. The profession of physicist is suitable for men.	41.3%	7.7%	26.4%	3.3%	21.3%
24. Teachers have a bad public image, i.e., a low social status.	3.8%	7.2%	15.1%	29.0%	44.9%
25. Physics teachers have low self-confidence, so they cannot impose themselves as authorities in society.	45.4%	20.3%	22.8%	8.2%	3.3%
26. Students have a negative attitude toward physics.	9.7%	11.0%	31.0%	31.0%	17.2%
PROFESSIONAL DEVELOPMENT					
27. There are not enough university study programs for the education of future physics teachers.	30.8%	17.4%	31.8%	11.8%	8.2%
28. University study programs for the education of future physics teachers do not sufficiently develop practical competencies.	13.6%	13.3%	33.1%	26.2%	13.8%
29. Physics teachers are not offered quality in-service programs.	10.8%	14.1%	34.4%	28.2%	12.6%
30. The requirements for admission to the physics study program for teachers are too strict.	41.3%	20.3%	28.7%	5.9%	3.8%
31. There is a lack of lifelong learning programs to retrain non-physicists to become physics teachers.	21.5%	10.0%	40.5%	13.8%	14.1%
OPPORTUNITIES					
32. Physicists have more opportunities in the labor market compared to experts from other fields.	10.3%	10.3%	32.1%	28.5%	19.0%
33. Employees with knowledge of physics are increasingly needed in industry.	4.6%	5.6%	26.4%	34.9%	28.5%
34. Physics as a subject is not equally available to students in schools with different educational profiles, so not everyone has the same opportunity to experience the benefits of physics education.	5.9%	6.2%	32.6%	32.3%	23.1%
35. Many students are taught by unprofessional physics teachers who cannot ensure the quality of physics education.	4.1%	3.8%	22.6%	27.9%	41.5%
36. Physics teachers take jobs that pay better than teaching in schools.	0.3%	1.0%	10.3%	36.7%	51.8%

Uzroci nedostatka učitelja i nastavnika fizike u Hrvatskoj

Konferencija TAUP2023

U Beču se je od 28. kolovoza do 1. rujna održala konferencija XVIII International Conference on Topics in Astoparticle and Underground Physics (TAUP2023). Marina Manganaro održala je predavanje "Axion-like particles constraints obtained by MAGIC observations of the Perseus cluster". Koautori predavanja su Giacomo D'Amico (University of Bergen), Ivana Batković (University of Padova and INFN Padova), Michele Doro (University of Padova). Predstavljeni rezultati bi uskoro trebali biti objavljeni u članku kojeg vodi Ivana Batković.
Jelena Strišković održala je predavanje "Constraints on Lorentz Invariance Violation using the extraordinary flare of Mrk 421 in 2014 ". Koautori su Daniel Kerszberg (IFAE), Giacomo D'Amico (University of Bergen) i Tomislav Terzić (University of Rijeka), a članak je također u izradi.
Više detalja može se naći na stranicama konferencije taup2023.hephy.at.

Marina Manganaro izlaže na konferenciji TAUP2023.

54. Astronomska ljetna škola

54. Astronomska ljetna škola, koju organizira Zvjezdarnica Zagreb, održana je na Petehovcu kraj Delnica od 9. do 16. srpnja. Mateo Paulišić je 10. 7. održao predavanje i demonstracijski pokus "Detekcija kozmičkih zraka". Uz uvod o kozmičkim zrakama, porijeklu i prvim detekcijama te načinu rada različitih detektora, polaznicima škole demonstrirao je scintilacijski detektor sa postavom za mjerenje života miona (uz grafički softver koji je napisao Karlo Mrakovčić), te maglenu komoru koja se jako svidjela polaznicima. Ivana Poljančić Beljan održala je 13. 7. predavanje i radionicu pod naslovom "Kako bismo zvučali na drugim planetima i prirodnim satelitima". Cilj radionice bio je približiti polaznicima fizičke koncepte zvuka te primijeniti stečena znanja na specifične atmosferske uvjete Venere, Marsa i Titana s ciljem određivanja "kako bismo zvučali" na tim planetima i satelitima.
Astronomska ljetna škola namijenjena je učenicima osnovnih škola od petog do osmog razreda. Obično sudjeluje oko 40 djece iz cijele Hrvatske i inozemstva te 10 voditelja i demonstratora. Program i izvješće o ljetnoj školi dostupni su na Internet stranici Zvjezdarnice Zagreb.


Ivana Poljančić Beljan na 54. Astronomskoj ljetnoj školi.

Predavanje za školarce u Pazinu

Mateo Paulišić održao je na dječjem kampu u Pazinu predavanje o noćnom nebu i formiranju zvijezda. Predavanje je popraćeno promatranjem saturna teleskopom. Uzrast polaznika bio je šarolik, a većinom su sudjelovali učenici viših razredima osnovne škole. Predavanje je organiziralo "Društvo naša djeca".

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