



**ZBORNIK
POVZETKOV
RAZISKOVALNIH
NALOG**

v slovenskem in
angleškem jeziku



**28. REGIJSKO SREČANJE MLADIH RAZISKOVALCEV
SPODNJEGA PODRAVJA IN PRLEKIJE V LETU 2020**

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Mladinskemu raziskovalnemu delu na pot



doc. dr. ŠTEFAN ČELAN, direktor ZRS Bistra Ptuj



Foto: Črtomir Goznik

Mladinskemu raziskovalnemu delu na pot

Namen nas, ki se ukvarjamo s projektom uvajanja mladih v znanost je, da bi v mladih zadržali naravno otroško vedoželjnost. Zato pri mladinskem raziskovalnem delu ne gre v prvi vrsti za odkrivanje novih teoretičnih spoznanj, gre bolj za to, da učenci in dijaki spoznajo principe in metode raziskovalnega dela. Tako kot mora mladi zidar spoznati principe in metode dela, če želi zgraditi stolpnico, jih mora tudi mladi znanstvenik, če želi nekoč posegati po rezultatih svetovno primerljive znanstvene odličnosti.

Kljub navidezni nezkušenosti, razpolagajo mladi raziskovalci z ogromnim potencialom vedoželjnosti in neobremenjenega in »neukalupljenega« razmišljanja. Vse te lastnosti pa so potrebne, da bodo nekoč dosegli vrhunske znanstveno-raziskovalne rezultate. Z udeležbo na različnih prireditvah posvečenim znanstveno-raziskovalni dejavnosti si gradijo socialno mrežo bodočih partnerjev, ki jo pri resnem delu še kako potrebujejo.

Ob mladih raziskovalcih ne smemo pozabiti na vlogo mentorjev, ki so v številnih primerih ključni mejnik za njihov nadaljnji razvoj. Med najpomembnejše kompetence mentorja sodi, da med množico mladih prepozna tiste z največjo željo in kompetencami za raziskovalno delo. Nadalje mora mentor znati postavljati visoke cilje in kriterije, hkrati pa mora paziti, da niso previsoki in bi v mladih raziskovalcih uničili motivacijo. Nenazadnje pa mora med mentorjem in raziskovalcem obstajati medsebojno zaupanje in spoštovanje, tudi v tistih trenutkih, ko ne gre vse tako, kot je bilo načrtovano. V teh trenutkih je mentorjeva vloga neprecenljiva.

Vsem dosedanjim mladim generacijam in njihovim mentorjem čestitam za prehojeno pot z željo, da bi na njej vztrajali še na mnoga leta.

Ptuj, september 2020

doc. dr. Štefan ČELAN

POVZETKI

RAZISKOVALNIH NALOG

OSNOVNOŠOLCEV IN SREDNJEŠOLCEV



ASTRONOMIJA
ALI FIZIKA

Regijsko srečanje mladih raziskovalcev
Spodnjega Podravja in Prlekije:
video srečanja, 20. – 28. maj 2020

Jedrska fuzija



Raziskovalci: Aljaž Habjanec, Filip Fras, Sandro Čeh
Mentorja: Maja Smiljan, Grega Belšak
Šola: Osnovna šola Ljudski vrt
Recenzent: dr. Dragica Pešaković

Povzetek:

V zadnjih dvesto letih energetika pridobiva vedno večji pomen v naši družbi, s tem pa se pojavljajo tudi številni načini pridobivanja energije. Nekateri imajo slab vpliv na naše okolje, drugi so neučinkoviti. Okolje skušamo obvarovati z večanjem rabe obnovljivih virov energije – sončna, hidro, vetrna, geotermalna. Vendar smo na tem področju, globalno gledano, premalo učinkoviti.

Tu nam rešitev predstavlja jedrska energija – jedrska fuzija, ki je tako okolju prijazna, kot tudi energetsko zelo učinkovita. Iz tega razloga smo se odločili spisati raziskovalno nalogo o jedrski fuziji. Ob potrebah fuzije za energetiko smo se poglobili v pogoje, s katerimi lahko privedemo do reakcije, na kakšen način jo lahko najučinkoviteje izkoristimo, kakšen vpliv ima na okolje in ljudi ter kako lahko tega izničimo.

Mi smo se odločili narediti raziskovalno nalogo o jedrski fuziji zato, da bi prikazali vse prednosti in pomanjkljivosti jedrske fuzije.

Poiskali smo podatke in jih sestavili v smiselno in skrženo celoto. Med iskanjem smo odkrili, da jedrska fuzija vseeno ni čisto čisti vir energije, ker je izotop vodika, tritij, radioaktiven. Po tem, ko smo našli to informacijo smo se odločili narediti eksperiment o tem, kateri materiali najbolj zaustavljajo sevanje. V principu odločanja, katere elemente naj uporabimo smo naredili anketo in izbrali nekaj najpogostejših predlogov in jih testirali.

V raziskovalni nalogi smo si zastavili tri hipoteze in eno tezo, na katere bomo z različnimi raziskovalnimi metodami odgovorili.

Summary:

Energy has been gaining increasing importance in our society over the last two hundred years, and many ways of generating energy are emerging. Some have a bad impact on our environment, others are ineffective. We try to protect the environment by increasing the use of renewable energy sources - solar, hydro, wind, geothermal. However, in this area, globally, we are underperforming.

The solution here is nuclear energy - nuclear fusion, that is both environmentally friendly and energy efficient. For this reason, we decided to write down a nuclear fusion research assignment. With the needs of energy fusion, we have deepened into the conditions, by which we can lead to a reaction, how we can make the most of it, what impact it has on the environment and people, and how we can eliminate it. We have decided to do a nuclear fusion research assignment in order to show all the pros and cons of nuclear fusion.

We searched for information and compiled it into a meaningful and condensed whole. During the search, we discovered that nuclear fusion is not a pure source of energy, because the isotope hydrogen, tritium, is radioactive. After finding this information, we decided to experiment with which materials best stopped radiation. In principle, deciding which elements to use we did a survey and selected some of the most common suggestions and tested them.

In the research paper, we set out three hypotheses and one thesis, which we will answer with different research methods.

BIOLOGIJA

Tišje, prosim



Raziskovalki: Dina Grabovac, Lina Šnajder

Mentorici: mag. Irena Kandrič, dr. Nataša Rizman Herga

Šola: Osnovna šola Ormož

Recenzent: Mitja Lah

Povzetek:

Zvok je lahko harmonično (čisti toni) ali neharmonično (šum, hrup) zvočno valovanje, ki ga sprejemamo z zunanjim, srednjim in z notranjim ušesom in s središčem za sluh v velikih možganih, kjer se te informacije spremenijo v subjektivno zaznavanje zvoka. Ker je po izsledkih raziskav več kot polovica slovenske populacije preobremenjena s hrupom, nas je zanimalo stanje na naši šoli. V raziskavi, ki smo jo izvajali od septembra 2019 do januarja 2020 so sodelovali mlajši (4. in 5. razred) in starejši (8. in 9. razred) učenci OŠ Ormož. V raziskovalni nalogi smo uporabili metodo analize virov, metodo meritev, metodo anketiranja, intervjuje s strokovnjaki s področja hrupa in metodo možganske nevihte. Izmerili smo, da je na naši šoli izven pouka najbolj hrupna jedilnica v času glavnega odmora, ter ugotovili, da so tudi pri nas meritve izven in v času pouka pokazale presežene dovoljene vrednosti hrupa. Novost naše naloge je v tem, da smo merili hrup glede na obliko pouka in metodo dela; najhropnejše je bilo skupinsko delo, ki si ga učenci, kljub temu da jih hrup moti, želijo, a hkrati hočejo, da nekdo drug (učitelj) zanje ustvarja tišje okolje. Ugotovili smo, da si kar 81 % anketiranih učencev občasno želi mir in tišino v šoli, da pa fante naše šole hrup manj moti kot dekleta ter da mlajše učence hrup bolj moti kot starejše. Novost je tudi ugotovitev, da pogosta uporaba slušalk vpliva na dožemanje zvoka, saj so učenci, ki pogosteje uporabljajo slušalke, bolj tolerantni do hrupa. Anketirani učenci so povedali, da imajo zaradi hrupa pri pouku v visokem deležu (med tistimi, ki jih hrup moti) težave pri zbranosti (89 %) in izven pouka težave pri komuniciranju. V manjšem deležu pa so v tej povezavi izpostavljali fiziološke težave (glavobol, okvare sluha), kar pa seveda opisuje le njihovo trenutno subjektivno dožemanje hrupa, ne daje pa dokončnih odgovorov. Zaznavanje zvokov je za človeka izjemnega pomena, zato je pomembno ohraniti naš slušni organ zdrav. V šoli lahko k temu veliko pripomorejo učitelji z večjo netoleranco do hrupa, z doslednim opozarjanjem učencev na tišje zvočno okolje (kar so si v velikem deležu zaželeli tudi učenci), z izobraževanjem učencev o pomenu tišjega zvočnega okolja, o samokontroli ter ostali pedagoški in tehnični ukrepi.

Summary:

A sound can be a harmonic (clear tone) or unharmonic (noise) sound wave, which we receive with our outer, middle and inner ear and the center for hearing in the cerebrum, where that information changes into subjective understanding of the noise. According to results of previous research papers, more than half of the Slovene population is exposed to too much noise, therefore, we were interested in the condition in our school. Younger (4th to 5th grade) and older (8th to 9th grade) students from primary school Ormož took part in our research, which we carried out from September 2019 to January 2020. In our research paper we used the method of analyzing sources, the method of measuring, a survey, interviews with professionals in the field of noise and the method of brainstorming. We measured that in the time outside classes and found out, the loudest area is our cafeteria during the recess. We found out that the measurements in our school during and outside of class exceeded the limit. We also measured according to the method of work and form of teaching; the loudest was in group work, which the students want, even though the noise bothers them, they don't want someone (a teacher) to create a peaceful environment. We found out that 81 % of students occasionally wish for peace and quiet in our school, that the boys in our school are less bothered by noise than girls and younger students are more bothered by noise than older students. We also discovered that headphones affect our comprehension of noise, because the students who frequently use headphones turned out to be more tolerant of noise. A large amount of students, who took the survey said that noise bothered them, said that it makes it hard for them to concentrate (89 %) during and outside class. It also makes them harder to communicate. A smaller amount of them said they have physiological issues (headache, hearing problems), what only describes their current comprehension of noise, rather than final answers. A detection of sounds is very important for humans, so it's important to keep our hearing organ healthy. In school teachers can help us with that by being less tolerant towards noise, by warning students, when they are being too loud (what most students wished for), by educating students about the importance of a peaceful environment, about self control and other pedagogical and technical measures.

EKOLOGIJA Z VARSTVOM OKOLJA

Cvetlice v kulinariki



Raziskovalki: Rozalija Lia Muršec, Živa Gabrovec

Mentorice: Sonja Lenarčič, Jana Jerenec, Klavdija Murko

Šola: Osnovna šola Kidričevo

Recenzent: dr. Štefan Čelan

Povzetek:

V okviru programa Ekošole, kjer vzgajamo lastni šolski vrt s cveticami, se nama je porodila ideja, da bi te cvetove uporabili v kulinariki, kajti poleg dobrega okusa za želodec je potrebno »nahriniti« tudi oči. Naš vrt je zelo bogat s sivko in tudi z ostalimi zelišči ter s sadeži – maline, jagode, aronija, timijan, majaron, žajbelj, dobra misel ... Raziskovali sva tudi uporabne cvetice v kulinariki in njihov estetski videz.

S pomočjo ankete med gospodinjami sva poizvedovali o poznavanju cvetic našega prostora, v koliki meri ga uporabljajo v kulinariki pri peki peciva, v juhah, omakah, kot okras na tortah in kolačih ... in kako bi lahko uporabo cvetja v kulinariki predstavili tudi širše. Ugotavljava, da se s cvetjem v kulinariki gospodinjje ne ukvarjajo pogosto. Sami sva spekli sezonsko pecivo s cvetjem in uživali v okusu in estetiki. Zanimala naju je tudi raba zelišč – cvetnic v širšem prostoru, predvsem v tradicionalnih jedeh in napitkih, kajti sodobni čas vedno bolj zapostavlja pristnost narave in naravnih esenc in jih zamenjuje z industrijsko proizvedenimi nezdravimi ekstrakti.

Namen raziskovalne naloge je obuditi misel Nazaj k naravi, obuditi praktičnost cvetic – niso samo za okras, jedem zbuditi estetski videz, prikazati zdravilno učinkovitost cvetic in ne nazadnje naju vodi želja po trajnostnem razvoju turizma in po ohranjanju okolja in kulturne dediščine.

Summary:

As part of the Eco-School programme, we grow our own flower garden. We had an idea to use these flowers in cuisine, not only because we need good taste for our stomach, but we also need our food to look attractive on a plate. Our garden is very rich in lavender and other herbs and fruits, such as raspberries, strawberries, aronia, thyme, marjoram, sage, origano, etc. We also explored useful flowers in cuisine and their aesthetic appearance.

We conducted a survey among housewives, where we inquired about the knowledge of the flowers of our area, the extent to which they are used in cuisine when baking cakes, soups, sauces, as well as in decorations on cakes and how we could present the use of flowers in cuisine more widely. We came to a conclusion that housewives do not often use flowers in their cuisine. We baked seasonal pastries with flowers ourselves and enjoyed their taste and aesthetics. We were also interested in the use of herbs and flowers in the wider geographical area, especially in traditional food and beverages, since modern times increasingly neglect the authenticity of nature and natural essences and replace them with industrially produced unhealthy extracts.

The purpose of this research paper is to evoke the thought of Back to Nature, to restore the practicality of flowers and the aesthetic appearance of food, to show the healing effectiveness of flowers, and last but not least, we are driven by the desire for sustainable tourism and the preservation of the environment and cultural heritage.

Ali res onesnaženost ozračja vpliva na barvo sončnih zahodov?



Raziskovalke: Blažka Margušič, Zala Roškar, Vita Toplak

Mentorici: Nataša Vauda, Jelica Ilić

Šola: Osnovna šola Mladika

Recenzent: dr. Štefan Čelan

Povzetek:

V sklopu naše naloge smo raziskovale povezanost med barvo sončnega zahoda in onesnaženostjo ozračja. Ugotavljale smo delež delcev PM10, ogljikovega monoksida, ogljikovega dioksida, žveplovih spojin in smoga v ozračju. Iskale smo podatke tudi o tem, katere snovi sestavljajo naše ozračje, v kolikšnih količinah in zakaj sploh nastanejo.

V teoretičnem delu smo raziskale, kako škodljive snovi iz ozračja vplivajo na človeka in na barve sončnih zahodov. Tehten razmislek smo namenile vprašanju, kako lahko onesnaženost zmanjšamo. Zbirale smo slike sončnih zahodov iz let 2019 in 2020 ter primerjale vsebnost delcev PM10, kakršna je bila v ozračju januarja 2019, z vsebnostjo teh istih delcev v ozračju, kot je bila leta 2020 istega meseca.

V empiričnem delu pa smo uspele dokazati, da se barva sončnih zahodov spreminja glede na onesnaženost. S primerjavo slik sončnih zahodov iz let 2019 in 2020 ter s podatki, ki smo jih dobile iz ARS-a, smo dokazale tudi, da se onesnaženost ozračja spreminja. Iz podatkov smo razbrale, kako onesnaženo je ozračje z delci PM10 ter ob slike pripisale naše ugotovitve.

Summary:

As a part of our research we have explored the connection between the colour of the sunset and the air pollution. We have tried to find the content of PM10, CO, CO₂, sulphur's compounds and smog in the atmosphere. We have been searching for the information which substances make up our atmosphere, in what quantities and why they even arise. In the theoretical part we have researched how the harmful substances affect people, and the colour of sunsets. It has been of our great consideration how to reduce the pollution. We have collected the pictures of sunsets taken in the years of 2019 and 2020, and compared the content of PM10 particles in the atmosphere of January 2019 to the content of the same month in the year 2020.

In the empirical part we have managed to prove that the colour of the sunsets changes accordingly to the pollution. By comparing the pictures of the sunsets from the years 2019 and 2020 and from the data, we received from ARS, we have shown that the air pollution is in fact changing. From the data, we have realized how polluted with the PM10 particles the atmosphere is, and we have appended our findings to the pictures.

Pamet v glavo, gremo skupaj rešit naravo



Raziskovalki: Hana Hren, Hana Kocet

Mentorica: Katja Leva

Šola: 2. osnovna šola Slovenska Bistrica

Recenzent: Mitja Lah

Povzetek:

Za raziskovalno nalogo z naslovom Pamet v glavo, gremo skupaj rešit naravo smo se odločili zato, ker smo sami vzgojeni in naravnani zelo ekološko, zraven tega pa izredno spoštujemo našo naravo. Ker šola ni le izobraževalna, ampak tudi vzgojna institucija, je prav, da je zgled učencem in okolju, v katerem se nahaja. Na naši šoli so prav iz tega razloga začeli slediti načelom zmanjševanja uporabe plastike. Že zadnjih nekaj let na šoli skušamo izločiti uporabo plastike, kjer jo lahko oziroma je možno. V letošnjem šolskem letu smo na šoli naredili velik korak – vode v plastenkah, ki smo jih dobivali ob namenskih dnevih, ko izobraževalni proces ni potekal v šolskih prostorih, smo zamenjali za bidone. Naš namen raziskovalne naloge je bil, da raziščemo in preračunamo, koliko kg plastičnih odpadkov smo s tem prihranili naravi.

Želimo, da s pomočjo raziskovalne naloge učenci naše šole dodatno okrepijo spoštovanje do narave. Prav tako želimo, da spoznajo, koliko plastike lahko »pridelamo« z enim namenskim dnevom. Želimo si, da rezultati ankete ter naš prikaz onesnaženega planeta s plastenkami, ki smo ga naredili v avli šole, podata bralcem raziskovalne naloge močno sporočilo o prekomerni uporabi plastike. Seznaniti jih želimo z resnostjo problema, ki ga povzroča poraba vode v plastenkah. Želimo, da učenci znajo odpadni material, v tem primeru plastenko, tudi ponovno uporabiti. Zato so nekateri oddelki tekom šolskega leta izdelovali različne izdelke iz plastenk.

Na začetku raziskovanja smo si postavili štiri hipoteze.

H1: Predvidevamo, da se učenci 2. osnovne šole v večini strinjajo, da je uporaba bidonov dobrodošla novost na šoli.

H2: Predpostavljamo, da si učenci 2. osnovne šole ne predstavljajo, koliko odpadkov pridelamo, ko pijemo vodo v plastenki.

H3: Domnevamo, da učenci v večini dnevno uporabljajo bidone.

H4: Predvidevamo, da smo v tem šolskem letu zmanjšali uporabo plastike na šoli.

V teoretičnem delu smo najprej predstavili kaj je plastika in katere vrste plastike poznamo. Predvsem smo se osredotočili na plastenke za vodo in kaj ogromna uporaba le-teh povzroči našemu planetu. V zadnjem teoretičnem delu smo predstavili zgodbo avtorice Leonard, v kateri je zapisala, kako in zakaj smo ljudje začeli piti vodo iz plastenke. Opisali smo postopek nastajanja plastenk in se osredotočili na okoljske posledice, ki jih ustvari plastika. V literaturi smo poiskali različne članke in raziskave, kjer je predstavljena uporaba plastenk v ZDA in v Sloveniji.

V drugem, raziskovalnem, delu smo s pomočjo anketnega vprašalnika skušali potrditi ali ovreči zgoraj omenjene hipoteze. Anketni vprašalnik so reševali učenci obeh oddelkov petega in devetega razreda naše šole. Učenci so enkrat v mesecu februarju namensko dobili pri malici vodo v plastenkah, saj smo kasneje s temi plastenkami v avli šoli prikazali, kakšen kup odpadne embalaže smo ustvarili. Nato smo preko šolskega radia učence še osveščali, kako pomembno je zmanjšanje uporabe plastike za naše okolje.

S pomočjo različnih metod dela smo ugotovili, da so učenci pozitivno sprejeli zamenjavo plastenk za bidone, da se zavedajo posledic, ki jih plastična embalaža povzroči, da si niso predstavljali, da ustvarimo toliko odpadne plastenke. Prav tako smo ugotovili, da učenci še vedno premalo pijejo in le mali odstotek učencev s sabo dnevno nosi bidone. Zagotovo pa lahko trdimo, da smo na šolski ravni močno zmanjšali uporabo plastike napram prejšnjim letom.

Summary:

We chose this research project because we have been raised in a way to respect, protect and preserve the natural world. We think schools should not just educate children but also raise children's ecology awareness. With different kinds of activities schools can help children grow into ecologically aware citizens. In the last few years our school has paid a lot of attention to the number of plastic waste it creates. After considering options, we have found various ways to reduce it. One of the most important steps towards reducing plastic waste was to stop giving children single-use plastic bottles and encouraging them to bring in reusable drink bottles. The main aim of our research project was to find out how many kilograms of plastic we have saved.

We would like this research project to raise students' awareness and respect towards our planet. We would like them to see how much plastic waste we produce in just one day. We wish the results of our survey and the poster of the Earth polluted with single-use plastic bottles to make a strong statement about the plastic pollution and for them to actually see the problem of using single-use plastic bottles.

One of our aims was also to teach our students about good environmental habits, meaning reusing and recycling. Therefore, some of our students have been reusing single-use plastic bottles in many different ways.

Here are the hypotheses of our research project.

Hypothesis 1: Students agree that reusable drink bottles are a good idea.

Hypothesis 2: Students are not aware of the amount of plastic waste produced in just one day by using single-use plastic bottles.

Hypothesis 3: Most of the students use reusable drink bottles during the day.

Hypothesis 4: Students think we have reduced the amount of plastic at our school in this school year.

In the theoretical part we introduced and explained the concept of plastic and different kinds of plastic. We focused on single-use plastic bottles and what their use means for our Planet. We concluded the theoretical part by introducing a story written by Leonard. In this story the author talks about how and why people started drinking bottled water. We also describe how single-use plastic bottles are made and the effect plastic waste has on our environment. We read many articles and researches which talk about the use of single-use plastic bottles in the United States of America and Slovenia.

In the empirical part we conducted a survey to prove the hypotheses true or false. The survey was given to our fifth and ninth graders. In February students were given single-use plastic bottles for the purpose of our research. With these bottles we wanted to show our students how much plastic waste we create in just one day. On our school radio we talked about how important it is to reduce plastic waste and how important this is for our Planet.

With the help of different methods, we found out that students feel positive about changing single-use plastic bottles for reusable drink bottles and that they are aware of the consequences plastic waste has on our environment. Students were shocked when we introduced them to the amount of plastic waste created in just one day. One of our important findings is that students still do not drink enough during the day and that only a small number of them brings reusable drink bottles to school every day. But we are proud to say that the number of plastic waste at our school has lowered in this year according to years before.

Plastika? Ne, Hvala!



Raziskovalec: Gaja Ganzitti, Ema Masarič

Mentorica: Mateja Zupanec

Šola: Osnovna šola Gustava Šiliha Laporje

Recenzent: Mitja Lah

Povzetek:

Za raziskovalno nalogo z naslovom *Plastika? Ne, hvala!* sva se odločili, ker nama je mar za prihodnost našega planeta in ohranjanje narave. Z navdušenjem sva sprejeli ukrepa šole: ukinitve vode v plastenkah pri malicah za na pot (s seboj prinašamo svoje stekleničke) in plastičnih vrečk za malico (nadomestili smo jih s papirnatimi vrečkami).

Raziskali sva, koliko smo kot majhna vaška šola pripomogli k obvarovanju narave pred plastiko v obdobju 4 mesecev, koliko smo s tem prihranili in kako sta ukrepa šole sprejeta med učenci in vodstvom šole.

Postavili sva si tri hipoteze. Prvo hipotezo Predvidevava, da bomo v obdobju štirih mesecev naravi prihranili približno 650 plastenk in približno 650 plastičnih vrečk sva delno potrdili. Naravi smo prihranili 898 plastenk in prav toliko plastičnih vrečk. Drugo hipotezo Predvidevava, da finančni prihranek ne bo visok sva potrdili, saj prihranek glede na stroške šole ni bil visok. V 4 mesecih je znašal 135,52 €. Tretjo hipotezo Predvidevava, da je ukrep šole dobro sprejet s strani učencev in vodstva šole sva potrdili. Vseeno pa naju je negativno presenetilo, kolikšen odstotek učencev še vedno kupuje vodo v trgovini in kolikšen odstotek učencev je že pozabil prinesiti svojo stekleničko na kakšnega od dni dejavnosti, ki potekajo izven šole. V izogib temu problemu predlagava uvedbo »izposojevalnice stekleničk«.

Naloga je odprla nova ekološka vprašanja med učenci in učitelji na šoli. V 7. a iščemo nove možnosti, kako zmanjšati količino mešanih odpadkov, ki trenutno predstavljajo visok strošek. Zadalimo si cilj, da izobesimo zgovorna sporočila, ki nas bodo nagovarjala k zmanjšanju odpadkov.

Summary:

We have decided to do a research paper with title *Plastic? No, thank you!* because we care about the future of our planet and preserving the nature as well. We enthusiastically took action by the school: abolishing the bottled water at snacks to go (we bring our own bottles) and plastic snack bags (replaced with paper bags). We investigated how much we, as a small village school, contributed to protecting nature from plastics over a 4-month period, how much money we saved, and how school measures were taken between students and school leaders.

We have set three hypotheses. First hypothesis It is estimated that in the course of four months we will save the nature from about 650 bottles and about 650 plastic bags, and this was partially confirmed. We saved 898 bottles of nature and just as many plastic bags. Second hypothesis We assume that the financial savings will not be high, since the savings were not high in terms of school costs. In 4 months it was 135.52 €. Third hypothesis We assume that the school action is well received by the students and the school management was confirmed. However, we were surprised by the percentage of students who still buy water in the store and the percentage of students who had forgotten to bring their bottle to one of the days of activities outside the school. To avoid this problem, we suggest the introduction of a "bottle rental".

The research opened up new ecological issues between students and teachers at the school. In grade 7 we are looking for new ways to reduce the amount of mixed waste that currently represents a high cost. We have set ourselves the goal of putting forth eloquent messages that will encourage us to reduce waste.

Zimsko štetje Mokožev *Rallus aquaticus* v naravnem rezervatu Ormoške lagune



Raziskovalki: Lara Petek, Viktorija Unuk

Mentorji: mag. Gabrijela Plateis, Tilen Basle, mag. Dominik Bombek

Šola: Šolski center Ptuj, Biotehniška šola

Recenzent: dr. Štefan Čelan

Povzetek:

ker so predstavniki družine Tukalic Rallidae v glavnem vezani na močvirja in zaraščena vodna telesa, jim izsuševanje močvirij in regulacije vodotokov vedno bolj krčijo njihov naravni življenjski prostor.

Mokož *Rallus aquaticus* spada med ptice, ki se na območju Ormoških lagun pojavlja zelo pogosto in imajo status ptice gnezdilke.

Z raziskavo opravljeno v tej nalogi smo želeli odgovoriti na raziskovalno vprašanje »Koliko mokožev *Rallus aquaticus* je prezimovalo na območju Naravnega rezervata Ormoške lagune v zimi 2019/2020?«

Ob šestih zaporednih popisih oz. štetjih smo zaznali precej različno število ptic. V mesecu novembru in decembru 2019 smo našli povprečno 10 mokožev na celotnem območju štetja bazenov.

V drugi polovici meseca decembra in v mesecu januarju 2020, pa se pojavljanje mokoža zelo zmanjšalo, saj smo le v prvem januarskem štetju zaznale en osebek.

Ogroženost ptic bi lahko zmanjšali z izvedbo preprostih namakalnih sistemov za površinsko namakanje, ki bi omogočali ohranitev njihovega življenjskega prostora – habitata in s tem večje biotske pestrosti.

Summary:

As representatives of the Tukalic Rallidae family, who are mainly tied to marshes and overgrown water bodies, wetland drainage and stream regulations cause disappearance of their natural habitat.

Rallus aquaticus is one of the birds which occurs very frequently in the area of the Ormož lagoons and has the status of a breeding bird.

With the research done in this assignment, we wanted to answer the research question; "How many *Rallus aquaticus* water rail have hibernated in the area of the Ormož Lagoon Nature Reserve in the winter 2019/2020?"

Having six consecutive censuses respectively various numbers of birds were detected in the counts. In the months of November and December 2019, we counted an average of 10 water rails in the entire pool counting area.

In the second half of December and January 2020, however, the occurrence of water rails decreased significantly, with only one specimen detected in the first January count.

The threat to birds could be reduced by implementing simple surface irrigation systems that would allow them to conserve their habitat and thus greater biodiversity.

ETNOLOGIJA

Fašenk v Spuhlji



Raziskovalki: Kaja Kralj, Lea Strelec

Mentorjs: Majda Kramberger Belšak, Robert Mlakar

Šola: Osnovna šola Mladika

Recenzentka: Ines Bezjak

Povzetek:

Vas Spuhlja se prvič omenja leta 1286, ko je dal salzburški nadškof v zastavo nekatere vasi okoli Ptuja. Danes je Spuhlja del Mestne občine Ptuj, in sicer ena izmed primestnih četrti. V Spuhlji nam je zelo pomembno druženje vaščanov. Zadnjih 13 let je za druženje pomemben pustni čas. Takrat je Marko Klinc postal princ ptujskega karnevala pod imenom Klinc Hauptman Spuhljanski VII. Z njim je bila ustanovljena skupina Tlačani, ki predstavljajo prinčeve podložnike. Tlačani se predstavljajo kot srednjeveška skupina, ki je aktivna tudi v pustnem času. V Spuhlji pa v pustnem času ni živahno le zadnjih 13 let, ampak so se vaščani maskirali že prej. Maskirali so se po skupinah, družinah in posamezno. Hiše so že nekoč obiskovali tradicionalni pustni liki kot so: koranti, piceki, ruse in orači, v katere so bili ravno tako našemljeni domačini. Pred sedemindvajsetimi leti so se koranti združili in ustanovili društvo, ki je še danes zelo aktivno. Pred petimi leti se je v Spuhlji na pobudo Marka Šamperla ustanovila skupina picekov. Za Spuhljo je tudi značilno, da hodijo po vasi, od hiše do hiše, ruse in orači. Da je dogajanje v predpustnem in pustnem času v Spuhlji zelo pestro, poskrbi tudi karnevalska skupina, ki deluje zadnjih trinajst let.

Summary:

The village Spuhlja was first mentioned in 1286, when the archbishop of Salzburg included some of the villages around Ptuj in the flag. Today, Spuhlja is a part of the municipality of Ptuj, as one of the suburbs. For the villagers of Spuhlja it is very important to socialize and spend quality time with each other. For the last 13 years, carnival has been very important in this respect. 13 years ago, their villager Marko Klinc became the Carnival Prince of Ptuj, by the name Klinc Hauptman Spuhljanski VII. He was accompanied by the carnival group "tlačani" (serfs), who represented his subjects. "Tlačani" present themselves in a medieval manner and are active at carnival time. Spuhlja has been very active in the carnival for the past 13 years and even so before. In Spuhlja, there were different carnival groups and traditionally they went from house to house every day during the carnival time. Some of the traditional carnival masks are "koranti", "piceki", "ruse" and "orači". 27 years ago, the "koranti" of Spuhlja came together and formed a society active to this day. Five years ago, due to an initiative of Marko Šamperl the group "piceki" was formed. For the village of Spuhlja it is very common that groups like "rusa" and "orači" visit every house in Spuhlja. To make the carnival unforgettable, a local carnival group has been preparing various events for the past 13 years.

Kako je pa tebi ime?



Raziskovalki: Zana Kovačič, Katarina Šela

Mentorivs: Marjetka Čas

Šola: Osnovna šola Gustava Šiliha Laporje

Recenzentka: Ines Bezjak

Povzetek:

Namen najine raziskovalne naloge je bil, da ugotoviva, kako so se spreminjala imena v Laporju od začetka 20. stoletja pa vse do danes. Raziskati sva želeli tudi, kako so se dejavniki, ki so vplivali na izbor imen v preteklosti, razlikovali od tistih danes, kakšne so razlike v pogostosti imen v preteklosti in danes ter ali se odraslim in otrokom zdi pomembno ohranjanje tradicije in starih avtohtonih slovenskih imen.

Dela sva se lotili z zbiranjem virov in literature, na terenu sva obiskali informatorja, gospoda Janeza Osvalda, ter izvedli anketo med starši in učenci 7., 8. in 9. razreda. Z anketo sva želeli ugotoviti, kaj je vplivalo na izbor imen v preteklosti in kaj vpliva na izbor imen danes, ali anketiranci poznajo pomen svojega imena, ali vedo, kdo jim je izbral ime, in ali se jim zdi pomembno ohranjanje tradicije in starih avtohtonih slovenskih imen.

Raziskovalni intervju sva opravili z gospodom župnikom Janezom Osvaldom. Povedal nama je, da so v preteklosti starši pri izbiri imena upoštevali predvsem družinsko tradicijo in vero, danes pa starši otrokom izbirajo predvsem modna oz. zvočna imena. Ko išče otrokovega izhodiščnega zavetnika, pogosto uporablja leksikon imen. Poudaril je, da je v Laporju prisotnih še nekaj hišnih imen, ki se skozi več generacij niso spreminjala. Gospod župnik zagovarja ohranjanje tradicije in starih avtohtonih slovenskih imen.

Iz analize anket sva ugotovili, da so tako v preteklosti kot danes imena izbirali predvsem starši, na njihov izbor pa sta vplivala popularnost in izvirnost imena. Večjo vlogo sta v preteklosti imeli družinska tradicija in vera, manjšo pa poimenovanje po znanih osebnostih. Pomemben dejavnik v preteklosti in danes je vsečnost imena. Več je anketirancev, ki pomena svojega imena ne poznajo, kot tistih, ki ga. Stara avtohtona slovenska imena danes v Laporju žal vedno bolj izginjajo. Večini se ohranjanje tradicije in starih avtohtonih slovenskih imen zdi pomembno, saj menijo in želijo, da se stara imena ohranijo kot del nesnovne kulturne dediščine. Želijo si tudi, da bi jih poznali naši potomci.

Summary:

The aim of our research was to establish how the names in Laporje have changed from the 20th century till now.

We wanted to find out how the factors that influenced the name selection have changed over that period of time, what are the differences in name frequency today and in the past, and whether the adults and children still find the preservation of autochthonous names important.

We have started our research by collecting data and sources of literature, we have visited an informer Janez Osvald and conducted a survey among the students from 7th, 8th and 9th form. The survey was used to provide information about the name decision in the past and today. We wanted to determine, if the respondents are aware of the meaning of their names, who has chosen their names and if they find it important to preserve the autochthonous Slovenian names.

A qualitative research interview was conducted with the local priest Janez Osvald. He told us that traditionally parents named their children considering family and religious traditions. Today parents usually pick more fashionable children's names. Parents often use name lexicon when choosing religious names. Mr. Osvald emphasized that in Laporje one can still find some old nicknames, which have stayed the same over many generations. Mr. Osvald is for the preservation of traditional autochthonous Slovenian names.

The analysis of data collected by the survey revealed, that children were usually given names by their parents and that still hasn't changed today. Parents used to choose the names for their children according to their popularity and originality. In the past the religion and traditions played an important role, people didn't use to name their children after celebrities. Appealingness of the name has always been an important factor. There is a larger amount of respondents who don't know the meaning of their names. Unfortunately, the old autochthonous names are more and more disappearing in Laporje. The majority of respondents find the preservation of traditions and old autochthonous Slovenian names important. In their opinion, it is vital to preserving old names as a part of cultural heritage. They think it is important for our descendants to know them.

Nova odkritja v zbirki mojstra fotografske umetnosti Dragiše Modrinjaka



Raziskovalca: Oskar Kaljun, Charlie Križanec Stojnšek

Mentor: dr. Andrej Šafhalter

Šola: Osnovna šola Anice Černejeve Makole

Recenzent: Ines Bezjak

Povzetek:

Znan slovenski fotograf Dragiša Modrinjak je večino svoje poklicne poti delal za časnik Večer. Bil je večkrat nagrajen fotograf in velik zbiralec fotografske opreme in fotografij od poznega 19. stoletja dalje. Po več kot tridesetih letih zbiranja je zapustil veliko bogastvo tehnične in kulturne dediščine. Po njegovi smrti leta 2011 so zbirko prevzeli njegovi otroci in del le-te razstavili na ogled v Fotografskem muzeju Modrinjak, kjer je predstavljen razvoj fotografske opreme in tehnologij. Del zbirke predstavlja tudi množica fotografskih negativov na steklu, katerih domnevni avtor je Jože Koren. Dostop do zbirke nama je omogočil sin Dragiša Modrinjaka, Matej Modrinjak.

V raziskovalni nalogi sva predstavila zbirko Dragiša Modrinjaka, bolj podrobno pa njen del, ki jo predstavljajo stekleni negativni, o katerih pred raziskavo ni bilo znanih veliko podatkov. Steklene negative sva preštela, popisala in fotografirala ter jih s pomočjo računalnika spremenila v pozitivne.

Ker se v letu 2020 pripravlja razstava tega dela fotografske zbirke Dragiša Modrinjaka v Fotografskem muzeju Maribor, sva želela z najino raziskavo pomen zbirke obogatiti in narediti zanimivejšo.

Summary:

Famous Slovenian photographer Dragiša Modrinjak spent most of his career working for the newspaper Večer. He was an award-winning photographer and a major collector of photographic equipment and photographs since the late 19th century. After more than thirty years of collecting, he left behind a wealth of technical and cultural heritage. After his death in 2011, his children took over the collection and put it on display at the Modrinjak Photo Museum, where the development of photographic equipment and technologies is presented. Part of the collection is a set of photographic negatives on glass, allegedly authored by Jože Koren. Dragiša Modrinjak's son Matej Modrinjak enabled the access to the collection for us.

In the research paper, we presented Dragiša Modrinjak's collection, and in more detail part of the negatives on glass collection. Little information was known before the survey. We counted, listed and photographed the glass plate negatives and turned them into positives using a computer.

The exhibition of this part of the photographic collection of Dragiša Modrinjak is being prepared at the Photography Museum Maribor in 2020. With our research paper we wanted to enrich the meaning of the collection and make it more interesting.

MATEMATIKA ALI LOGIKA

Pitagorov izrek in podobnost



Raziskovalci: Klara Sužnik, Teja Črnko Širec, Rok Vajngerl

Mentorica: Stanka Drobnak

Šola: Osnovna šola Destrnik-Trnovska vas

Recenzentka: dr. Anamarija L. Mrgole

Povzetek:

Zvezo med ploščinami kvadratov nad stranicami pravokotnega trikotnika imenujemo Pitagorov izrek: v pravokotnem trikotniku je ploščina kvadrata nad hipotenuzo enaka vsoti ploščin kvadratov nad katetama.

S pomočjo raziskovalne naloge smo želeli Pitagorov izrek spoznati malo drugače. Z raziskovanjem obravnavane teme smo ugotovili, da lahko kvadrate nad stranicami pravokotnega trikotnika zamenjamo s pravilnimi večkotniki, vendar Pitagorov izrek še vedno velja. Želeli smo raziskati, ali obstaja še kakšna druga povezava med liki, ki jih narišemo nad stranicami pravokotnega trikotnika. Ker v 9. razredu pri pouku obravnavamo podobnost, senam je porodila ideja, da bi poskušali s podobnimi liki.

Ugotovili smo, da Pitagorov izrek velja tudi, če nad stranice pravokotnega trikotnika narišemo podobne like. Da smo dokazali, da trditev velja tudi za splošne primere, smo si pomagali s programom GeoGebra in z računanjem.

Summary:

The relation between the surfaces of squares above the sides of a right triangle is called the Pythagorean theorem: the area of the square which side is the hypotenuse is equal to the sum of the areas of the squares on the other two sides.

With this research paper we wanted to discover the Pythagorean theorem in a different way. By investigating the topic further, we found that the squares above the sides of the rectangular triangle can be replaced with other regular polygons and that the Pythagorean theorem still applies. We wanted to explore if there was any other connection between the shapes we drew above the sides of the right triangle. Because we are 9th-grade students, the idea of trying to make similar shapes quickly came up. We have found that the Pythagorean theorem applies even if similar figures are drawn above the sides of a right triangle. We've done it with the help of Geogebra and calculating. Subsequently, we proved that this also applies to general cases.

KEMIJA ALI KEMIJSKA TEHNOLOGIJA

Težke kovine v zelenjavi



Raziskovalca: Nejc Črepnjak, Boris Lozinšek

Mentorica: Maja Smiljan

Šola: Osnovna šola Ljudski vrt, podružnica Grajena

Recenzent: dr. Dušan Klinar

Povzetek:

V raziskovalni nalogi je obravnavana problematika s področja onesnaženja zelenjave s težkimi kovinami. Zanimalo nas je ali lahko za ekološko pridelovanje dejansko rečemo, da daje optimalne rezultate glede vsebnosti onesnaževalcev v hrani. Vzorce, ki smo jih pridobili, smo ločili v tri skupine, glede na poreklo in način pridelave. Zelenjavo smo najprej mehansko obdelali – razrezali in sesekljali – nato pa vzorcem dodali zmes klorovodikove in dušikove kisline – zlatotopko – katere lastnost je topljenje žlahtnih kovin. Vzorce smo po »prekuhavanju«
filtrirali, nato pa iz njih pripravili vodne raztopine, ki smo jih analizirali v atomskem absorpcijskem spektrometru. Ugotovili smo, da različne vrste zelenjave različno akumulirajo kovine in tudi, da je vsebnost onesnaževalcev odvisna od številnih dejavnikov, ne samo od načina pridelovanja poljščin.

Summary:

The research projects deals with the problem of heavy metal contamination of vegetables. We were interested if organic production can actually be said to give optimal results in the content of contaminants in food. The samples obtained were separated into three groups according to origin and method of production. The vegetables were first mechanically processed - cut and chopped - a mixture of hydrochloric and nitric acid – aqua regia - was added to the samples, the property of which is the melting of precious metals. Samples were filtered after boiling and then aqueous samples were prepared solutions analyzed in an atomic absorption spectrometer. We have found that different types of vegetables accumulate metals differently and also that the pollutant content depends on many factors, not just the way crops are grown.

Resnica o aditivih



Raziskovalki: Lara Kolar, Sara Bele

Mentorici: Jasna Cafuta, Anita Malovič

Šola: Osnovna šola Podlehnik

Recenzent: dr. Dušan Klinar

Povzetek:

Glavna tema najine raziskovalne naloge so aditivi. Za to temo sva se odločili, saj nama je ta tema blizu in naju zelo zanima. Z aditivi se namreč srečujemo vsak dan, pa se tega pogosto sploh ne zavedamo. Temu sva podrobneje raziskali in naleteli na naslednja vprašanja:

1. Kaj so aditivi, zakaj se uporabljajo in kje jih najdemo?
2. Ali so potrošniki dovolj ozaveščeni o aditivih, njihovih lastnostih in morebitnih učinkih na zdravje?
3. Ali so aditivi škodljivi, in če so, ali so škodljivi vsi?

Da sva lahko odgovorili na zastavljena vprašanja, sva s pomočjo literature in spleta ugotovili, kaj so aditivi in jih podrobno raziskali. Opravili sva tudi anketo, s katero sva ugotavljali ozaveščenost potrošnikov o aditivih. Anketo so izpolnili anketiranci različnih starosti, različnih poklicev in dobili sva res zanimive odgovore. Da bi se lahko prepričali o tem, kako so aditivi označeni na ovojnini in v katerih živilih so prisotni, sva odšli v trgovino in tam opravili terensko delo. V empiričnem delu sva v šolski kuhinji izdelali svoje opečene kruhke brez aditivov in z dodanimi aditivi (ene povsem brez aditiva, ene z rožmarinovim ekstraktom oziroma naravnim aditivom, ene pa z butil hidroksianizolom (BHA), ki pa naj bi bil, glede na podatke iz literature, rakotvoren) in njihove lastnosti primerjali med sabo. Opravljena raziskovalna naloga nama je poglobila znanje o aditivih in prinesla veliko izkušenj na področju raziskovanja.

Summary:

The main subject of our research paper are additives. We have picked this subject, because it's something that we're close to and very interested in. Additives are a big part of our lives and we don't even realise it. We have decided to research about additives and we have come across these questions:

1. What are additives, what are they used for and where can we find them?
2. Are consumers made aware enough about additives, their qualities and possible effects on one's health?
3. Are additives harmful to health, and if yes are all of them harmful to health or only a part of all additives?

To be able to answer the questions we stated above, we first researched about additives in detail with the help of internet and other literature. We also handed out surveys, with the help of which we found out an average consumer's mindset and awareness about additives. We sent the surveys to multiple firms and we got some interesting feedback. To see how additives are labeled on the packaging of the product, we went to a store and did fieldwork. In the empirical part of the research paper we went to our school's kitchen and made our own toasted bread and compared their qualities to purchased ones.

This research paper deepened our knowledge about additives and brought us lots of research experience.

Uravnavanje aktivnosti encimov v moki



Raziskovaki: Alja Rozman, Mateja Golc

Mentorji: dr. Boris Zmazek, dr. Maja Leitgeb, dr. Gordana Hojnik Podrepšek

Šola: Gimnazija Ptuj

Recenzent: dr. Štefan Čelan

Povzetek:

Pšenična moka je zelo priljubljeno živilo po vsem svetu. Cilj te raziskave je bil raziskati učinek superkritičnega ogljikovega dioksida (SC CO₂) na specifično aktivnost encima polifenol oksidaze. Polifenol oksidaza je vpletena v pojav rjavenja moke, ki se pojavi po daljšem času skladiščenja. Odločili sva se, da s posebnim postopkom inaktivirava encim polifenol oksidazo in tako preprečiva neželjeno reakcijo rjavenja. Bela pšenična moka je bila obdelana z uporabo SC CO₂ pri različnih pogojih izpostavitve v visokotlačnem reaktorju. Za obdelavo je bil uporabljen SC CO₂ pri različnih tlakih (200 in 300 bar), pri konstantni temperaturi 35 °C in različnih časih izpostavitve (3 ure in 24 ur). Iz rezultatov je razvidno, da ima SC CO₂ vpliv na aktivnost encima polifenol oksidaze, saj pri določenih pogojih dosežemo njegovo inaktivacijo.

Prav tako sva tekom eksperimentalnega dela določili delež vitamina C v različnih vrstah moke in ugotovili, da je delež vitamina C odvisen od vrste moke. Delež vitamina C sva določili tudi v moki, obdelani s SC CO₂, in ugotovili, da vsebnost vitamina C upada s podaljševanjem časa izpostavitve in višjem tlaku.

Summary:

Wheat flour is a very popular food worldwide. The aim of this study was to investigate the effect of supercritical carbon dioxide (SC CO₂) on the specific activity of the enzyme polyphenol oxidase. Polyphenol oxidase is involved in the process of browning that causes reactions at the storage time of flour. We decided to inactivate the enzyme polyphenol oxidase by a special procedure to prevent the unwanted browning reaction. White wheat flour was treated by using SC CO₂ under various exposure conditions in a high-pressure reactor. The treatment of white wheat flour was performed by SC CO₂ under different pressures (200 and 300 bar), at a constant temperature of 35°C and with different exposure times (3 hours and 24 hours). The results show that SC CO₂ influences on the activity of the enzyme polyphenol oxidase, since under certain conditions the enzyme inactivation is achieved.

During the experimental work the proportions of vitamin C in different types of flour were determined and it was found out that the proportion of vitamin C depends on the type of flour. The Vitamin C content was also determined in SC CO₂-treated flour and it was discovered that the vitamin C content decreases as exposure time and pressure increase.

PSIHOLOGIJA ALI PEDAGOGIKA

»Že videno«



Raziskovalka: Ema Vantur

Mentorica: Mateja Zupanec

Šola: Osnovna šola Gustava Šiliha Laporje

Recenzentka: Bojana Murko

Povzetek:

K raziskovalni nalogi me je nagovorila pesem Deja vu, katero sta si na zaključni ekskurziji na avtobusu prepevali moji sošolki.

V teoretičnem delu naloge sem povzela besede strokovnjakov in avtorjev različnih člankov. Nato pa sem si zastavila pet hipotez: 1. več kot polovica anketirancev je že doživela deja vu, 2. deja vu je doživelo več žensk kot moških (v %), 3. starejši anketiranci znajo pojav bolje razložiti kot mlajši, 4. mlajši anketiranci pojav pogosteje doživljajo kot starejši in 5. večina anketiranih se ne spomni čustev ob doživljanju pojava deja vu.

Po analizi spletnega anketnega vprašalnika, katerega so izpolnili učenci od 7. a do 9. a in odrasli, sem prišla do zanimivih spoznanj. Ugotovila sem, da je res že več kot polovica anketirancev doživela deja vu. Ne morem pa potrditi, da je med njimi več oseb ženskega spola, saj se je izkazalo, da v doživljanju pojava med spoloma ni bistvenih razlik. Prav tako nisem potrdila, da znajo starejši anketiranci bolje razložiti pojav od mlajših, saj so bili učenci tukaj uspešnejši. Sem pa potrdila, da mlajši učenci deja vu doživljajo pogosteje. Pri zadnji hipotezi se je izkazalo, da se večina anketirancev spomni čustev ob doživljanju deja vu-ja.

Za zaključek sem izvedla poskus na učencih od 7. a do 9. a po zgledu psihologa Larryja L. Jacobyja. Ugotovila sem, da sva dobila različne rezultate.

Summary:

The song Deja vu, which my classmates sang at the final bus excursion, addressed me to make the research paper about it.

In the theoretical part of the thesis I summarized the words of experts and authors of various articles. Then I made five hypotheses: 1. more than half of the respondents have already experienced Deja vu, 2. Deja vu has experienced more women than men (in %), 3. older respondents are better able to explain the phenomenon than younger, 4. younger respondents are more likely to experience the phenomenon than the elderly and 5. most of the respondents do not remember the emotions when experiencing the occurrence of Deja vu.

After analysing the online survey questionnaire completed by students from grade 7 to grade 9 and adults, I came to some interesting insights. I found that more than half of the respondents had already experienced Deja vu. However, I cannot confirm that there are more women among them, as it has been shown that there are no significant differences in the experience of gender. I also did not confirm that older respondents were better able to explain the phenomenon than younger ones, since the students were more successful than the adults. But I confirmed that younger students experience more often Deja vu. The last hypothesis showed that most of the respondents remember the emotions when experiencing Deja vu.

In conclusion, I conducted an experiment on students from grade 7 to grade 9, following the example of psychologist Larry L. Jacoby. I found we had different results.

Kako obrenjeni so učenci OŠ Ljudski vrt v primerjavi s tujimi vrstniki?



Raziskovalki: Ajda Hajnal, Špela Hajnal

Mentorica: Edita Čelofiga

Šola: Osnovna šola Ljudski vrt

Recenzentka: Bojana Murko

Povzetek:

V nalogi so prikazane razlike v tem, kako učenci 9. razreda naše šole doživljajo šolo v primerjavi z vrstniki iz Hrvaške in Srbije - v kolikšni meri so učenci višjih razredov naše šole dejansko obremenjeni s šolskim delom, v kolikšni meri se čutijo obremenjene s šolskim delom, koliko so obremenjeni z obšolskimi dejavnostmi in koliko prostega časa imajo na voljo. V teoretičnem delu naloge je opredeljen pojem obremenjenosti in obseg obveznih ur pouka v 9. razredu v Sloveniji ter zadnjem, 8. razredu v Srbiji in na Hrvaškem, število predmetov in število izbirnih predmetov. V empiričnem delu naloge so prikazani rezultati anketnega vprašalnika – povprečno zadovoljstvo učencev s šolo, časa, ki ga učenci dnevno porabijo za domačo nalogo in učenje ter za obšolske dejavnosti, obremenjenost učencev z rednim šolskim delom – poukom in delom za šolo doma ter obšolskimi dejavnostmi.

Summary:

The thesis shows the differences in the way 9th grade students of our school experience school compared to peers from Croatia and Serbia - the extent to which the students of the upper classes of our school are actually burdened with school work, the extent to which they feel burdened with school work, how much they are burdened with after-school activities and how much free time they have available. The theoretical part defines the concept of workload and the amount of compulsory lessons in the 9th grade in Slovenia and the last, 8th grade, in Serbia and Croatia, the number of subjects and the number of elective subjects. The empirical part of the thesis shows the results of the questionnaire - the average satisfaction of students with school, the time spent by students daily for homework and learning, and for extracurricular activities, the workload of students with regular school work - teaching and working at home and after-school activities.

EKONOMIJA ALI TURIZEM

Ekološko ali neekološko?



Raziskovalka: Klara Loboda

Mentorica: Saša Krajnc Bek

Šola: Osnovna šola Gustava Šiliha Laporje

Recenzentka: mag. Mirjana Nenad

Povzetek:

Namen moje raziskovalne naloge je bil, da raziščem, kakšni načini pridelave hrane obstajajo oziroma so najpogosteje zastopani pri nas. Podrobneje sem opisala konvencionalni način pridelave hrane, integrirano pridelavo ter ekološko pridelavo. Teoretičnemu uvodu sem dodala vidik trženja izdelkov, certificiranja pridelanih izdelkov ter označevanja le-teh. V empiričnem delu sem se osredotočila na mleko kot produkt ponudbe v bližnjih trgovinah. Primerjala sem količinsko ponudbo ekološko in neekološko pridelanega mleka, ceno ter prodajo le-tega.

Raziskovanja sem se sprva lotila z zbiranjem teoretičnih osnov iz literature, kasneje pa sem leto nadgradila z metodo raziskovalnega intervjuja, saj sem trgovinam v Slovenski Bistrici poslala prošnjo za sodelovanje ter posredovanje podatkov, potrebnih za raziskavo. Ker pa od njih bodisi nisem dobila odgovora bodisi so zavrnili sodelovanje, sem se odločila za terensko delo, v okviru katerega sem v treh izbranih največjih trgovinah v Slovenski Bistrici pregledala ponudbo ekološko in neekološko pridelanega mleka. Podatke sem nato zbrala v tabelah, jih primerjala in analizirala. Ker od trgovskih družb nisem dobila podatka o prodaji teh izdelkov, sem raziskovanje nadgradila s kratko spletno anketo, h kateri sem povabila vse starše učencev OS Gustava Šiliha Laporje, ter jim zastavila dve vprašanji o njihovih nakupovalnih navadah glede mleka.

Iz analize terenskega dela sem ugotovila, da imajo živilske trgovine, ki sem jih vključila v analizo, v ponudbi veliko več neekološko pridelanega mleka kot ekološko pridelanega, kar v odstotkih pomeni, da je v trgovinah 90,22 % neekološko pridelanega mleka in le 9,78 % ekološko pridelanega. Primerjava povprečne cene na liter mleka je pokazala, da je ekološko pridelano mleko sicer dražje od neekološko pridelanega, vendar je razlika le med 8 in 21 %, sama pa sem predvidevala, da bo razlika veliko večja. Številčna ponudba ekološko pridelanega mleka je v vseh treh trgovinah bila približno primerljiva. Kar se tiče vidika nakupovanja mleka, sem ugotovila, da večina staršev še vedno raje kupi neekološko pridelano mleko, čeprav tudi odstotek tistih, ki pa že kupijo ekološko pridelano mleko, ni nizek. Cena ekološko pridelanega mleka se jim zdi v večini bodisi ravno prav določena bodisi previsoka.

V okviru raziskovanja sem kljub zavrnitvi določenih hipotez dosegla cilj, ki sem si ga zadala. Predvsem sem bolj spoznala razlike med različnimi načini pridelave hrane, obenem pa raziskala dejansko stanje ponudbe ekološko in neekološko pridelanega mleka v bližnjih trgovinah. Verjamem, da bi podatki bili še bolj natančni, če bi jih pridobila direktno od trgovskih družb, in obenem v tem primeru ne bi bilo potrebno vključevati staršev učencev naše šole, da bi s tem dobila vidik potrošnikov, pač pa bi podatek o prodaji zajemal celotno populacijo ljudi, ki kupujejo mleko v v raziskavo zajetih trgovinah.

Menim, da bi nalogo lahko še nadgradila. Med drugim z razširitvijo spletne ankete na področje poznavanja različnih načinov pridelave hrane, z vključitvijo možnosti nakupa mleka pri kmetih ter vzroki za nakup na določen način pridelanega mleka.

Menim, da je skrb za lastno zdravje ter varovanje okolja zelo pomemben dejavnik, ki bi nas moral spodbujati k nakupu in uživanju izdelkov, ki to podpirajo, torej izdelkov ekološke pridelave. Čeprav se zavedanje tega v zadnjem času med ljudmi sicer povečuje, je očitno še vedno prenizko za to, da bi bila ponudba ekološko pridelanih izdelkov v trgovinah večja, s tem pa posledično cena nižja, kar bi povečalo možnost nakupa teh izdelkov pri širši populaciji.



Summary:

The purpose of my research assignment was to find out what kinds of food production exist and are most commonly represented in our state. In more details, I have described the conventional, integrated and organic food production. In theoretical introduction I added the aspect of marketing of the products, certification and labelling. In the empirical section, I focused on milk as a product offered in our nearby stores. I made a comparison between the quantitative offer of organic and non-organic milk, its price and sale.

Initially, I began to collect theoretical bases from the literature, and later upgraded it with the method of a research interview, as I sent a request for cooperation to the stores in Slovenska Bistrica to provide the data needed for my research. Because I either did not receive any response from them or received a refusal to participate, I decided to do the fieldwork, in which I examined the offer of organic and non-organic milk in three largest stores in Slovenska Bistrica. Then I collected the data in tables, compared, and analysed them. Since I did not receive any data of the sales from the stores, I upgraded my research with a short online survey among all parents of pupils of the Gustav Silih Laporje Primary School and asked them two questions about their shopping habits regarding milk.

From the fieldwork analysis, I found out that the grocery stores I included in the research offer far more non-organic than organic milk, which in percent means 90,22 percent of non-organic milk and only 9,78 percent of organic milk. The comparison of the average price per litre of milk showed that organic milk is still more expensive than non-organic, but the difference is only between 8 and 21 percent and is not as high as I assumed. The supply of organic milk in all three stores was approximately comparable. As far as the shopping habits of milk is concerned, I have found out that most parents still prefer buying non-organic milk, although the percentage of those who already buy organic milk is not low. The price of organic milk, for most of them, seems either to be just right or too high.

Despite the rejection of certain hypothesis, I managed to achieve the goal I set. Above all, I have become more aware of the differences between different food production methods and explored the supply of organic and non-organic milk in nearby stores. I believe that the results would be even more accurate if they were obtained directly from the companies' databases and I would not have to involve the parents of our learners to get the consumer's perspective. The analysis would cover whole population of people who buy milk in target stores.

I think I could expand my research assignment by including the online survey about the customers' knowledge of different methods of food production, including the possibility of buying milk from farmers and the reasons for buying milk produced in a particular way.

Taking care of our own health and protecting the environment is a big factor that should encourage us to buy and consume products of organic production. Although this awareness has been increasing, it is clearly still too low to enlarge the supply of organic products in stores and decrease the price, which would increase the possibility of buying these products among public.

One of our goals was also to be seen or experienced all of the sights by the teenagers so we decided that we will form a short educational path that will be reachable for everybody and will be walk able in a short time so that teenagers will be able to walk through it in or two school period and they will see the resources of Ormož. Our educational path will be included in the offer of TIC Ormož so it will encourage teenagers to research the history of their home town, it's tourist and natural sights and cultural heritage of Ormož, because it is a beautiful town that we should cherish more than we do.

GEOGRAFIJA ALI GEOLOGIJA

Gnetenje pragerskih priložnosti



Raziskovalki: Ana Marie Babšek, Ema Doberšek

Mentorica: Bojana Marin

Šola: Osnovna šola Antona Ingoliča Spodnja Polskava, Podružnica Pragersko

Recenzentka: Julija Potisk

Povzetek:

V raziskovalni nalogi bova predstavili možnosti za razvoj turizma v našem domačem kraju oz. Krajevni skupnosti Pragersko-Gaj. Na razvoj Pragerskega je pomembno vplivala železnica, nezanemarljiv je tudi pomen pragerske gline in s tem povezano opekarstvo. Ker vsakodnevno opazujemo propadle zidove nekdanje opekarne, ki je bila nekoč našemu kraju v ponos in je slovela daleč naokoli, se nama je porodila ideja, kako bi lahko tradicijo našega kraja ponovno oživel. Turizem je danes zagotovo ena izmed gospodarskih dejavnosti, ki se bo v prihodnje še bolj razvijala in nudila priložnosti za razvoj alternativnih oblik množičnega turizma, kot so trajnostni, zeleni in ekoturizem. Meniva, da glina daje našemu kraju izvrstne priložnosti za tovrstni razvoj. Zanimalo naju bo tudi, koliko se učenci naše šole in sokrajani zavedajo možnosti turističnega razvoja Pragerskega. Na osnovi rezultatov bova izdelali predloge za razvoj turizma ter ohranjanja tradicije opekarstva. Razmišlja tudi o vzpostavitvi muzeja, ki bi predstavljal zgodovino opekarstva na Pragerskem. Pri raziskovanju se bova povezali s različnimi društvi, Krajevno skupnostjo Pragersko – Gaj ter posamezniki, ki jim je mar za razvoj našega kraja.

Summary:

In our research paper we are going to present the possibilities for touristical development in our home town, the local community of Pragersko-Gaj. The railway station definitely affected the development of Pragersko and we also can't forget about the meaning of Pragersko clay and potentially the brick industry. Everyday, when we observe the ruins of the old brick factory which brought pride to our town and it was famous everywhere, we came up with the idea of how to bring the tradition of our town back to life. Today, tourism is definitely one of the economic activities, which will progress and offer more opportunities for the development of alternative ways of mass tourism, like sustainable, green and eco tourism. Our opinion is that clay gives our town incredible opportunities for that kind of development. We are also interested in how many students of our school and how many citizens of our town are aware of the opportunities for the touristical development. Based on the results, we will make proposals for the development of tourism and the preservation of the tradition of brick industry in Pragersko. We are also thinking about setting up a museum that would represent the history of brick industry in Pragersko. When researching, we will connect with different societies, the local community of Pragersko – Gaj, and individuals who care about the development of our town.



Individualne značilnosti pisave učencev OŠ Gustava Šiliha Laporje

Raziskovalki: Alina Auer, Eva Zala Kitek

Mentorica: mag. Alenka Fidler

Šola: Osnovna šola Gustava Šiliha Laporje

Recenzentka: Katja Vrabl

Povzetek:

V razvitem svetu večina ljudi za pisanje uporablja tipkovnice in zaslone na dotik, z roko pišemo le občasno. Nasprotniki pisanja z roko menijo, da je pisanje z roko zastarela in nepotrebna spretnost, podporniki pisanja z roko pa poudarjajo, da je koordinacija rok in oči največja razvojna značilnost pisanja z roko in da pri pisanju z roko sodelujejo roke, misli, govor in globoka čustva, zato je učenje pisanih črk smiselno. V okviru raziskovalne naloge sva želeli ugotoviti, v koliki meri učenci od 4. do 9. razreda OŠ Gustava Šiliha Laporje pri pisanju še uporabljajo male in velike pisane črke in kako se pri učencih naučena šolska pisava spreminja v individualno pisavo. Osredotočili sva se na potezost pisanja malih in velikih pisanih črk o, f in s. Uporabili sva metodo analize zapisov učencev, ki so nastali pri pisanju šolskega nareka. Učenci slovenskih šol se v 1., 2. in 3. razredu naučijo pisati z velikimi in malimi tiskanimi ter velikimi in malimi pisanimi črkami. Pisave učencev se od šolske pisave razlikujejo. Učenci prvega in drugega razreda imajo težave pri lepomisju, ker še nimajo ustreznih grafomotoričnih spretnosti. Od devetega leta naprej se pisava učencev še bolj odmika od šolske pisave, ker se učenci navajajo hitrega pisanja. V višjih razredih se ta razlika še poveča tudi zaradi mladostniškega iskanja lastne identitete (Žagar, 1996). Najina raziskava je pokazala, da velike in male pisane črke pri pisanju zapiskov uporablja 60,6 % učencev od 4. do 9. razreda OŠ Gustava Šiliha Laporje. Med njimi je največ učencev 4. in 5. razreda in več dečkov kot deklic. Učiteljici 4. in 5. razreda glede na učni načrt za slovenščino pri učencih spodbujata pisanje z velikimi in malimi pisanimi črkami, medtem ko je teh spodbud od 6. razreda dalje manj. Ugotovili sva, da mlajši učenci pri pisanju bolj upoštevajo načela šolske pisave, vendar to ne drži za vse velike in male pisane črke, ki sva jih preverjali (o, f in s). Odstotek učencev, ki velike in male pisane črke o, f in s pišejo drugače, kot so se naučili pri pouku, ne narašča enakomerno po razredih, temveč se od razreda do razreda razlikuje.

Summary:

In developed world most people use computer keyboards or touchscreens to write, we write by hand only occasionally. Opponents of hand-writing suggest that writing by hand outdated and unnecessary competence, while supporters emphasize that eye-hand coordination in the biggest developmental characteristic of hand-writing. While writing by hand there are collaborations of hands, thoughts, speech and deep emotions, therefore learning of cursive writing makes sense. As part of the research assignment, we wanted to find out the extent to which pupils at Gustava Šiliha Laporje primary school, grades 4 through 9 still use uppercase and lowercase cursive letters while writing, how pupils change the learnt school writing into their individual writing. We have focused on the features of writing capital letters and uppercase letters o, f, and s. We used an analytical methodology of records of the pupils who wrote the school dictation. Pupils in Slovene schools learn to write in uppercase and lowercase print script letters and uppercase and lowercase cursive letters in grades 1, 2 and 3. Pupils' fonts differ from school fonts. First- and second-grade pupils have difficulty writing calligraphy because they do not yet have the appropriate graphomotor skills. From the age of nine onwards, pupils' writing moves further away from school writing because pupils are getting used to speed writing. In the upper classes, this difference is exacerbated by the adolescent's search for his identity (Žagar, 1996). Our research has shown that upper and lower case cursive letters are used by 60.6% of pupils in grades 4 through 9 at Gustava Šiliha Laporje primary school. Most of them are 4th- and 5th-grade pupils and more boys than girls. The teachers of grades 4 and 5 encourage them to write in upper and lower case cursive letters, according to the curriculum for Slovene, while there are less incentives from 6th grade onwards. We have found that younger pupils take the principles of school writing when writing more into account, but this does not hold stand for all upper and lower case cursive letters we assessed (o, f, and s). The percentage of pupils who write upper and lower case cursive letters o, f and s differently than they have learned in class does not increase steadily through grades but varies from grade to grade.

SLOVENSKI JEZIK ALI KNJIŽEVNOST

KMS?



Raziskovalke: Lana Zadavec, Ana Žnidarič, Jana Žnidarič

Mentorici: Brigita Brajković, Tina Zadavec

Šola: Osnovna šola Ormož

Recenzentka: Darja Plajnšek

Povzetek:

Sleng je ena najbolj znanih interesnih govoric, ki združuje isto stare govorce, najpogosteje mladino. Izraža se predvsem v uporabi besed, slengizmov. V raziskovalni nalogi smo se osredotočile na vprašanje, v kolikšni meri učenci 7., 8. in 9. razreda Osnovne šole Ormož uporabljajo sleng, kako sodobna tehnologija vpliva na sleng učencev ter kakšno vlogo ima sleng pri sporazumevanju med učenci in starši. Izvedle smo pilotsko anketo za zbiranje nabora slengizmov, anketo pri učencih in starših, raziskovalni pogovor s staršem, analizo besedil spletne komunikacije med vrstniki ter spletno obliko fokusne skupine z učenci. Ugotovile smo, da vsi učenci od 7. do 9. razreda uporabljajo sleng in da je med učenci razlika glede na starost, saj se mlajši učenci z vrstniki raje pogovarjajo na štiri oči, starejši pa predvsem s pomočjo sodobne tehnologije, in sicer s pisanjem. Vpliv pisanja preko sodobne tehnologije se kaže tudi v izrazni podobi slengizmov, med katerimi prevladujejo kratice, saj je zaradi njih pisanje lažje in hitrejšo. Učenci tudi v sporazumevanju s starši uporabljajo slengizme, čeprav se z njimi najpogosteje pogovarjajo v živo. Starši in večina sedmo-ter osmošolcev si želi, da bi starši razumeli sleng svojih otrok. Da bi prispevale k boljšemu sporazumevanju med starši in otroki, smo nabor slengizmov, ki smo jih pridobile z anketo, uporabile za nastanek spletnega slovarčka slengizmov z zvočnimi posnetki razlage pomena in s primeri iz rabe.

Summary:

Slang is the most known informal category of language that unites speakers of the same age, most often the youth. It is mainly expressed in the use of words, slangisms. The research paper focuses on the extent to which 7th, 8th and 9th grade students of Primary school Ormož use slang, how modern technology affects students' slang and what role slang plays in communication among students and parents. We conducted a pilot survey to collect a set of slangisms, a survey among students and parents, an exploratory conversation with a parent, a text analysis of online communication among peers, a word cloud method and an online focus group with students. We found that all students in grades 7 to 9 use slang and that there is a difference based on age, because younger students prefer to talk with their peers in person, older students prefer to talk using modern technology, by writing. The influence of writing using modern technology is also reflected in the expressive image of slangisms, which are dominated by abbreviations, because they make writing easier and faster. Students also use slangisms when communicating with their parents, although they mostly communicate with their parents in person. Parents and the majority of younger students want that the parents would understand their children's slang. In order to improve communication between parents and students, we used a set of the least known and the least used slangisms, obtained from the survey, to create an online dictionary of unknown slangisms with audio recordings explaining their meaning.

Nekoč, pred davnimi Markovci



Raziskovalci: Maj Bezjak, Jaka Glažar, Maša Žnidarič

Mentorica: Marjetka Vidovič

Šola: Osnovna šola Markovci

Recenzentka: Darja Plajnšek

Povzetek:

V raziskovalni nalogi smo zbrali in preučili izbrane pravljice iz izročila podravske občine Markovci. V teoretičnem delu smo predstavili ključna spoznanja iz teorije pravljic, od tega, kako jih opredelimo, do tega, na katere vrste jih delimo. V empiričnem delu smo zbrali starejše prebivalce Markovcev in jih posneli, kako pripovedujejo pravljice, ki jih dobro poznajo.

Pripovedi smo zapisali, s pomočjo teoretičnih spoznanj literarno analizirali in jih primerjali z njihovimi morebitnimi klasičnimi različicami. Ugotovili smo, da se pravljice v postopku ljudskega pripovedovanja spremenijo na vsebinski ravni, saj pride do izpuščanj ali preoblikovanj ključnih motivov. Prav tako dobijo samosvojo obliko, ko pripovedovalci uporabljajo raznorazna retorična in pesniška sredstva, da podajo učinkovito pripoved. V zaključku smo povzeli svoja opažanja in nakazali nadaljnje raziskovalne smernice na tem področju.

Summary:

In this research paper we collected and studied selected fairy tales from the heritage of the Municipality of Markovci in the Podravje region. In the theoretical part, we presented key findings from the theory of fairy tales, starting with how to define fairy tales to how to classify them. In the empirical part, we gathered participants, older residents of Markovci, and recorded them in the process of the storytelling of the fairy tales they knew well.

We transcribed the recordings, and, using our theoretical knowledge, performed literary analysis and comparison with potential classic variant of the fairy tales. We found that in the process of oral storytelling, fairy tales change on the level of content as we noticed omissions or changes in key motifs. They also change uniquely in regards to form as storytellers use a variety of rhetoric and poetic devices to enhance their performance. In the conclusion, we summarised our findings and pointed to avenues for future research.

Zgodba ali story?



Raziskovalka: Iva Grobelšek

Mentorica: Ana Pejkovič

Šola: Osnovna šola Majšperk

Recenzentka: Katja Vrabl

Povzetek:

Ljudje smo družabna bitja, živimo v skupnostih. Tako je sporazumevanje ena izmed naših primarnih potreb. Včasih je sporazumevanje temeljilo na osebnih stikih, danes temu ni več tako. Naši pogovori se vedno pogosteje odvijajo na družbenih omrežjih, ki niso pogojena z našo geografsko lego ali katero drugo lastnostjo. Jezik je živ sistem in se s časom spreminja, zato sem se odločila, da raziščem, kako naše spletne oblike sporazumevanja vplivajo na spremembe v jeziku. V raziskovalni nalogi sem ugotavljala, za kateri namen učenci uporabljajo družbena omrežja, kako dobro poznajo besedišče rabljeno na družbenih omrežjih ter koliko ga prenašajo v žive pogovore. Hkrati me je zanimalo, koliko je to besedišče poznano odraslim. Prav tako sem želela ugotoviti, kakšen je jezik v objavah na družbenih omrežjih in koliko so upoštevana slovnična pravila. Do ugotovitev sem prišla s prebiranjem literature, izvedbo ankete med učenci in odraslimi ter z analizo javno dostopnih objav na družbenih omrežjih Facebook in Instagram. Ugotovila sem, da učenci pomen besedišča družbenih omrežij dobro poznajo; vendar ga odrasli poznajo nekoliko bolje. Analiza javno dostopnih objav je pokazala, da se te približujejo vsakodnevnim pogovorom, saj zasledimo veliko narečnih besed; hkrati pa se kaže vpliv angleščine. V večini objav slovnična pravila niso upoštevana. Resnični in virtualni svet sta vedno bolj prepletena, kar pomembno vpliva tako na obliko jezika kot na pridobivanje novega besedišča.

Summary:

People are social beings; we live in communities. This is why communication is one of our basic needs. In the past, communication was based on personal contacts; today this is not the case anymore. More and more frequently our conversations take place on social media, which are not based on our geographical area or any other property. Language is a living system that changes over time. This is why I have decided to explore how our virtual forms of communication affect the changes in language. I have been exploring for which purpose do students use social media, how well do they know the vocabulary used in social media and to what extent do they transform it to live conversations. I wanted to see how well do adults know the vocabulary used in social media as well. At the same time I wanted to find out what language is used in posts on social media and whether grammar rules are taken into account. I came to the conclusions by reading literature, conducting a survey among students and adults and by analysing publicly accessible posts on Facebook and Instagram. I found out that students know the meaning of social media vocabulary quite well; but adults know it even better. Analysis of publicly accessible posts has shown that these are approaching live conversations, because dialect words are used and there is a great influence of English. Most of the posts do not consider grammar rules. The real and the virtual world are getting more and more intertwined, which has an important influence on the form of language as well as on the vocabulary acquisition.

FILOZOFIJA ALI SOCIOLOGIJA

Novodobni mediji - nadloga ali prednost?



Raziskovalki: Sanja Bevc, Žana Dorič

Mentorica: Tina Lešnik

Šola: Osnovna šola Gustava Šiliha Laporje

Recenzentka: Damjana Lah

Povzetek:

Z najino raziskovalno nalogo sva želeli preučiti v kolikšni meri uporabljajo starejši učenci naše šole novodobne medije, kot so razne aplikacije, družbena omrežja in spletna televizija. Prepričani sva, da imajo novi mediji poleg negativnih pozitivne posledice, če jih uporabljamo zmerno in kritično. Dokazati sva želeli, da lahko z redno uporabo novih medijev v angleščini izboljšava raven znanja angleškega jezika. Izvedli sva eksperiment. 6 tednov sva načrtno uporabljali medije v tujem jeziku in dokazali, da lahko s preudarno rabo le teh izboljšava raven angleškega jezika.

Izvedli sva anketo med učenci Osnovne šole Gustava Šiliha Laporje. Ugotovili sva, da učenci raje kot z uporabo medijev preživljajo prosti čas s prijatelji ali z družino. Presenetilo naju je, da ima večina učencev lastni računalnik, telefon in tablico. Najbolj popularna naprava med mladimi je mobilni telefon, tablice skoraj ne uporabljajo. Tuji jezik, ki ga učenci največkrat uporabljajo, je angleščina. Večina vprašanih se strinja, da z uporabo spletnih medijev v tujem jeziku lahko izboljšajo znanje angleškega jezika.

Summary:

We wanted to establish in what extent the new applications, media and TV on demand are used by older pupils of our school. We are determined that new media have not only negative, but also positive effects if they are used in a proper manner.

We wanted to prove, that by using modern media on a daily basis, the level of English can improve. We have conducted an experiment. Over a period of six weeks we were using media in English and improved our level of English.

We have carried out a survey among students of Gustava Šiliha Laporje school. We have established that the majority of questioned students prefer spending free time with friends and family. We were surprised by the fact that the majority of students possess a computer, tablet and a phone. The most popular device is a phone, tablets are not used very often. English is the preferred language that students use. The majority of students agree that their level of English can improve by using modern media in English.

Je ali ni? - To je zdaj vprašanje



Raziskovalca: Tibor Novak, Anže Šibila

Mentorica: Jana Jerenec

Šola: Osnovna Jana Jerenec

Recenzentka: Damjana Lah

Povzetek:

Smrt je edina stvar, s katero se moramo vsi soočiti. Ne glede na to, kako se je bojimo, se pred njo ne moremo obvarovati. Ne zdravo življenje, niti denar nam ne more pomagati. Večina ljudi se je boji, ker verjamejo, da je smrt končna postaja. Veliko ljudi ne verjame v posmrtno življenje. Zavedati se moramo, da je strah pred smrtjo povsem naraven. Vidimo ga lahko vsak dan, ko se ljudje soočajo s smrtjo svojih bližnjih. Nekateri pa se celo trudijo, da bi ustavili proces staranja in smrti. Veliko ljudi upa, da bo znanost omogočila še daljše življenje. Pogled na to tabu temo naju je privedel do tega, da sva si za letošnjo raziskovalno nalogo zadala cilj, da raziščeva, kako o smrti in posmrtnem življenju razmišljajo svetovne religije ter ali ljudje verjamejo in se odločajo verjeti v posmrtno življenje. To odločitev mora sicer sprejeti vsak posameznik zase. Hkrati pa sva želela odgovoriti sebi in drugim na vprašanja, ki se nam nehote porajajo ob misli na smrt. Dela sva se lotila tako, da sva prebrala nekaj strokovnih knjig ter sestavila anketo, s katero sva želela pridobiti odgovore, kaj o smrti in posmrtnem življenju menijo naši anketiranci. Odločila sva se, da pridobiva odgovore naših učencev, pedagoških delavcev, staršev in starih staršev. Nalogo sva še dodatno popestrila z intervjujem. Najine ugotovitve so naslednje: starejši kot so anketiranci, bolj se ukvarjajo z vprašanji, kot so: Kaj se zgodi, ko umremo? Bomo še kdaj videli svoje bližnje in drage? Ali obstaja posmrtno življenje? Ugotovila sva, da ljudje, ne glede na to, koliko smo stari, ali smo verni ali ne, kakšno izobrazbo imamo ter od kod prihajamo, razmišljamo o smrti in kaj se zgodi z nami po njej. Spoznala sva, da je ta tema razširjena, kljub temu da o njej ne želimo oziroma se o njej bojimo govoriti. Z najinim prispevkom želiva spodbuditi druge, da o tej temi ne bi več razmišljali kot o tabu temi in da bi sprejeli smrt kot nekaj, kar lahko pomeni tudi nov začetek.

Summary:

Death is the only thing we all have to deal with. No matter how afraid we are, we cannot protect ourselves against it. Not a healthy life, neither money can help us. Most people are afraid of death, because they believe death is the ultimate ending. Not many people believe in the afterlife. We must be aware that the fear of death is completely natural. We can observe this fear every day as people face the death of their loved ones. Some are even trying to stop the aging and death process. Many people hope that science will prolong life. A look at this taboo topic has led us to set ourselves the goal of this year's research. We tried to explore, how the world religions think about death and the afterlife and whether people believe and choose to believe in the afterlife. This decision must be made by each individual for himself. At the same time, we wanted to answer this questions that inadvertently arises when facing death. We started our work by reading some expert books and conducting a survey to get answers about what our respondents think about death and the afterlife. We asked our students, educators, parents and grandparents to participate in it. This task was further enhanced by the interview. Our findings are as follows: The older the respondents, the more concerned they are with questions such as: What happens when we die? Will we ever see our dear ones? Is there an afterlife? We have found that no matter how old we are, whether we are religious or not, what kind of education we have and where we come from, we think about death and what happens to us after it. We have learned that this topic is widespread, despite the fact that we do not want to talk about it or are afraid to talk about it. With our contribution, we want to encourage others to stop thinking about this topic as a taboo topic and to accept death as something that can also mean a fresh start.

Gremo na »ŠTRAJK«?!



Raziskovalki: Daša Horvat, Larisa Maček

Mentorica: Andreja Špacapan

Šola: 2. osnovna šola Središče ob Dravi

Recenzentka: Klavdija Srša

Povzetek:

Za to raziskovalno nalogo sva se odločili, ker sva bili aktivni na dveh podnebnih protestih, ki so ju organizirali po navdihu Grete Thunberg. Večkrat sva bili navdušeni nad čustvenimi govori Grete. Spremljali sva članke na spletu, zbirali informacije v šolskih učbenikih in knjigah. Povezovali sva informacije o Greti, Petkih za prihodnost, aktivnem državljanstvu, generaciji Z in argumentaciji. Osredotočili sva se na argumente iz Gretinih govorov, ki so prevedeni v slovenščino in objavljeni v knjigi Naša hiša je v plamenih. Analizirali sva argumente, ki ustrezajo Toulminovi shemi argumenta in vsebujejo pozive k aktivnemu državljanstvu in zahteve Petkov za prihodnost. V svojih argumentih Greta spodbuja k aktivnemu državljanstvu, ker verjame, da naš glas šteje. Ljudi, predvsem mlade, poziva k mirnim demonstracijam, poslušanju znanstvenikov in zahteva prebujanje politikov. Najpogosteje zahteva ohlajanje planeta in ustavitev izpustov ogljikovega dioksida v ozračje. S podnebnimi protesti je Greti uspelo motivirati več milijonov mladih aktivistov. Nagovorila je generacijo Z, s katero ji je skupno to, da imajo čut za okolje in komunicirajo s pomočjo spleta s kratkimi argumenti. Meniva, da bi morali še naprej spremljati argumentacijo Grete, njen vpliv na politike in državljane po celem svetu. Z nalogo želiva pomagati mladim pri odločitvi za sodelovanje pri podnebnih protestih ali proti njemu.

Summary:

We chose this research paper because we were active in the two climate protests, organized by Greta Thunberg. Many times, we were excited by Greta's emotional speeches. We followed her online articles, gathered information in our school textbooks and books. We compared full information on Greta, "Fridays for the future", active citizenship, Generation Z and argumentations. We focused on the arguments from Greta's speeches, which were translated in Slovene language in the book "Our House is on fire". We analyzed all the arguments who correspond to Toulmin's scheme of argument and contain calls for active citizenship in "Friday's requests for the future".

In her arguments Greta encourages for active citizenship, because she believes that our vote counts. Greta is appealing to people, especially young, for peaceful demonstrations, listening to scientists, and demands of politics to open their eyes. Her primary goal is cooling the planet and stopping the release of carbon dioxide into the atmosphere. Through climate protests, Greta has succeeded in motivating more than a million of young activists. She spoke to Generation Z, and their sense of the environment and communicating over internet through short arguments is what they have in common. We believe that we should continue watching Greta's arguments, her influence on politicians and citizens all over the world. We want to help young people to decide for or against the participation in the climate protests.

Računalnik: novodobna droga?



Raziskovalci: Jure Jesenek, Jernej Kosajnč, Anže Žnidarko

Mentor: Luka Husu

Šola: 2. osnovna šola Slovenska Bistrica

Recenzent: Damjana Lah

Povzetek:

Za raziskovalno nalogo Računalnik: novodobna droga? smo se odločili zato, ker nas zanima, kako je z zasvojenostjo z uporabo sodobne tehnologije pri učencih naše šole.

V teoretičnem delu raziskovalne naloge smo raziskali in predstavili, kaj je zasvojenost, vrste zasvojenosti ter razloge in posledice zanjo. V nadaljevanju smo predstavili tudi odvisnost in vrste odvisnosti ter oba pojma primerjali med sabo. V raziskovalnem delu naloge smo s pomočjo anketnega vprašalnika za učence petih, sedmih in devetih razredov ugotavljali, ali so učenci naše šole zasvojeni z uporabo računalnika in drugih elektronskih naprav. Trditve učencev in ugotovitve, pridobljene s pomočjo anketnega vprašalnika, pa smo podkrepili z intervjujem naše šolske svetovalne delavke.

Summary:

We decided to write a research paper with the title "Computer: A New Age Drug?" because we want to know whether it is addictive to use modern technology with students from our school.

In the theoretical part of the research paper, we investigated and presented what addiction is, the types of addiction, and the reasons and consequences for it. Furthermore, we outlined dependencies and types of dependencies, comparing the two concepts with each other.

In the research part of the paper, we were using the questionnaire for students in grades 5, 7 and 9 to determine if students from our school feel addicted to using computers and other electronic devices. The students' claims and the findings of the questionnaire were supported by an interview with our school counsellor.

Nimam dovolj prostega časa!



Raziskovalke: Pia Zemljarič, Maja Majcen, Saša Janžekovič

Mentorica: Špela Horvat

Šola: Osnovna šola Markovci

Recenzentka: Klavdija Srša

Povzetek:

V sodobnem svetu se otroci srečujejo z vse več pogostim pomanjkanjem prostega časa. Popoldanske dejavnosti, kot so obiskovanje različnih športnih vadb, vaje v prostovoljnih gasilskih društvih in obiskovanje glasbenih šol, so postale prava senzacija za današnje otroke. Otrokom ne ostaja več toliko časa za prosto igro, za druženje s prijatelji in z družino. Pri tem se postavlja vprašanje, ali imajo otroci sploh še kaj prostega časa?

Kot mlade raziskovalke smo se večkrat vprašale, kaj je bolje za nas radovedneže. Ali, da smo v popoldanskem času zaposleni in zasuti z najrazličnejšimi dejavnostmi, ali se raje prepustimo igri in delamo nekaj kar nas veseli. Z metodo ankete in grafične analize podatkov smo želeli spoznati, kako otroci na OŠ Markovci preživljajo svoj prosti čas, ali imajo učenci, ki so aktivni skozi ves dan, res boljše šolske rezultate in kaj točno vpliva na boljšo miselnost in organiziranost učencev, ki imajo še zraven popolnoma zasedenega urnika tudi čas za učenje.

V raziskovalni nalogi smo raziskale, kako se s tem vsem soočajo učenci in učenske OŠ Markovci, zraven tega nas je zanimalo tudi kako status športnika oz. status umetnika vpliva na organiziranost in boljše šolske rezultate. Iz anketnega vprašalnika za učence in učenske od 7. do 9. razreda smo ugotovile, da osnovnošolci premalo svojega prostega časa preživljajo v naravi in s prijatelji, veliko raje svoj prosti čas porabijo za posedanje pred računalniki. Zanimiva je tudi ugotovitev, da skoraj noben anketirani nima statusa športnika, ali umetnika. Najbolj nas je presenetila ugotovitev, da starši osnovnošolcev ne spodbujajo za aktivno preživljanje prostega časa. Osnovnošolci so zelo obremenjeni s šolskimi obveznostmi, čeprav kot država spadamo med majn obremenjene učence na svetu.

Summary:

In a modern world children are facing with the lack of free time. Afternoon activities, for example sport activities, volunteer fire service activities and visiting music schools have become a real sensation for the contemporary children. Children do not have enough time for unguided, relaxed games, for meeting with friends and family. This raises questions like: do children have any free time at all? We, young researches, are curious, what is better for us.

Do we need all afternoon extra activities or is better for us to spend free time doing what we like as much as possible? With the questionnaire and with the graphical analysis of the data we wanted to sum up how pupils of the Primary school Markovci spend their free time. Do pupils who are active through the whole day have better school results, what does affect more on thinking and organizing of students who have also extra activities beside lessons and if they have enough time to learn. In our research work pupils from Primary school Markovci were analysed. We also wanted to find out whether status of being a sportsmen or art status has an effect on better results and on the organisation of the pupils.

Questionnaire results which were taken from pupils from 7th till 9th grade showed that pupils do not spend enough time in the nature and with friends, they prefer spending time sitting in front of their computers. It is interesting that almost no pupils have sport status. Results also show that parents do not encourage their children for spending their free time on active way. Primary school pupils are stressed because of the capacity of learning, even though Slovenia is among countries which has less stressed pupils in comparison with the other countries in the world.

ZGODOVINA ALI UMETNOSTNA ZGODOVINA

Eksperimentalna arheologija v Rimskem kampu in vpliv dejavnosti na neformalno izobraževanje



Raziskovalka: Pia Klasinc

Mentor: Aljaž Selinšek

Šola: Osnovna šola Ljudski vrt Ptuj

Recenzentka: Bojana Murko

Povzetek:

Ptuj slovi kot najstarejše mesto v Sloveniji. Že v času rimljanov je bil Ptuj (takratni Poetovio) eno izmed najmočnejših mest v Rimskem imperiju. Leta 69 so na našem ozemlju prav pod vodstvom Markusa Antoniusa Primusa izglasovali Vespasiana za Rimskega cesarja.

Na prostoru današnjega mesta Ptuj je bila v antiki pod cesarjem Trajanom, ki je vladal med leti 98 in 117, ustanovljena kolonija poimenovana Colonia Ulpia Traiana Poetovio. Pred tem je bil vso prvo stoletje do Trajana tukaj legijski tabor z manjšo pripadajočo civilno naselbino. V tej raziskovalni nalogi sem ugotovila kako zelo pomembno je bilo mesto, in kako pomembno, je še zmeraj.

Zelo bi priporočila (predvsem mladostnikom), da bi se v osnovnih šolah več pogovarjali o tem kako mogočno mesto je bil Ptuj s poudarkom na razlogih. Ugotovila sem tudi kaj vse lahko Rimski kamp Poetovio pripomore k vsemu kar se v šoli učimo in kaj vse lahko s pomočjo eksperimentalne arheologije naredimo.

Summary:

Ptuj is known as the oldest city in Slovenia. Even in Roman times, Ptuj (then called Poetovio) was one of the most powerful cities in the Roman Empire. In 69 century, Vespasian was voted Roman emperor in our territory under the leadership of Marcus Antonius Primus.

In the present-day city of Ptuj, a colony called Colonia Ulpia Traiana Poetovio was founded in antiquity under Emperor Trajan, who reigned between 98 century and 117 century. Previously, throughout the first century until Trajan, there was a legion camp with a small civilian settlement. In this research assignment, I realized how very important he was, and still is, our place.

I would highly recommend (especially to teenagers) to talk more in elementary schools about how powerful Ptuj was and how important it was. I also found out what the Roman Poetovio camp can do to help everything we learn in school and what we can do with experimental archeology.



Šola in prosti čas z roko v roki

Raziskovalki: Maruša Pučnik, Brina Rahle

Mentorici: Veronika Frešer

Šola: 2. osnovna šola Slovenska Bistrica

Recenzentka: Mojca Slana

Povzetek:

Obšolske dejavnosti so pomemben dejavnik v otrokovem življenju. Medtem ko nas v šoli učijo po enotnem in splošnem programu, si prostočasne dejavnosti posameznik lahko izbere glede na lastne želje in interese. Zelo pomembne so za učence, ki pri pouku ne dosegajo vedno želenih rezultatov, pri obšolskih dejavnostih pa lahko razvijajo svoja močna področja in sposobnosti. Namen raziskovalne naloge je bil ugotoviti, kako učenci usklajujejo šolsko delo z obšolskimi dejavnostmi. Na podlagi teoretičnih spoznanj sva sestavili anketni vprašalnik za učence četrtega in osmega razreda 2. osnovne šole Slovenska Bistrica. Z njim sva želeli ugotoviti, kdo ali kaj ima glavni vpliv pri izbiri obšolskih dejavnosti. Zanimalo naju je tudi, ali so učenci zaradi obšolskih dejavnosti kdaj preobremenjeni oz. kako uspešno usklajujejo šolo in dejavnosti po njej. Prav tako sva želeli izvedeti, ali učenci pri prostočasnih dejavnostih razvijajo veščine in znanja, ki so v šoli prisotna le v manjši meri. Raziskali sva tudi razlike, ki so se pojavile v odgovorih med četrtošolci in osmošolci. Iz rezultatov ankete sva ugotovili, da si učenci prostočasne dejavnosti večinoma izbirajo v skladu z lastnimi željami, mlajši pa se odločajo tudi za tiste, ki jih izbirajo njihovi prijatelji. Večina učencev dobro usklajuje prostočasne dejavnosti, saj jih dojemajo kot sprostitvev in jim le občasno zmanjka časa za šolo. Tisti, ki pa imajo veliko število ur prostočasnih dejavnosti, so posledično tudi bolj obremenjeni in jim pogosteje zmanjka časa za šolo. Pri prostočasnih dejavnostih si učenci krepijo veščine in znanja, ki jih v šoli pridobijo v manjši meri. Najine ugotovitve so pokazale, da si večina četrtošolcev krepí ustvarjalnost in delo v skupini, osmošolci pa si večinoma krepijo samozavest in znajo boljše organizirati čas.

Summary:

Extracurricular activities are an important factor in a child's life. While at school we are taught the same things, one can choose leisure activities according to one's own preferences and interests. They are very important for students who do not always achieve the desired results in lessons, as they can develop their strong areas and abilities in extracurricular activities. The purpose of the research assignment was to find out how students coordinate school work with extracurricular activities. Based on theoretical knowledge, we have written a questionnaire for students of the fourth and eighth grades of 2. osnovna šola Slovenska Bistrica. We were interested in who or what has the main influence in the choice of after-school activity. We were also interested in whether pupils were fraught by extracurricular activities and how successful are they in coordinating the school and their activities. We also wanted to find out whether students develop skills in their leisure activities, which they develop to a lesser extent in school. Based on the survey results, we came to the following findings; We have found that leisure activities are mostly chosen according to their own wishes, while the younger ones also choose the ones chosen by their friends. Most students coordinate leisure activities well, as they find them relaxing and rarely run out of time for school. However, those who have a large number of leisure activities are also more burdened and have less time for school work. In leisure activities, students acquire the skills and knowledge they acquire to a lesser extent at school. Our findings show that most fourth graders are becoming more creative and develop skills such as group work, eighth graders are more self-confident and better at organizing their time.

INTERDISCIPLINARNA PODROČJA

Kupiti ali oprati?



Raziskovalka: Eva Kozoderc

Mentorica: Ivanka Čeh

Šola: Osnovna šola Cirkovce

Recenzentka: Mojca Slana

Povzetek:

Oblačila nas spremljajo celo življenje, nosimo jih praktično od rojstva, saj nas že nekaj minut po rojstvu zavijejo v prvi kos blaga. In ker si dandanes življenja brez oblačil praktično ne moremo predstavljati, sem se odločila da to tematiko podrobneje raziščem. Ali se kdaj vprašate, kje so nastala oblačila, ki jih nosite, kakšni procesi se uporabljajo za izdelavo, ali onesnažujejo okolje in ali morda vsebujejo škodljive snovi? Ste že kdaj zaznali neprijeten vonj ob vstopu v trgovino? Ali obstaja razlika, v kvaliteti, med lahko dostopnimi oblačili in dragimi kosi obleke? Kaj je bolj smiselno in prav: kupiti več kosov poceni oblačil ali eno samo za katero odštejemo več? Do odgovorov na zastavljena vprašanja sem prišla na podlagi prebrane ustrezne literature, intervjuja, ter praktičnih preizkusov, v katerih sem ugotovila prepustnost različnih kosov oblačil ter vpliv oblačil na piščančja jetra. Izvedla sem tudi anketo, ki je bila javno dostopna na spletni strani. Ugotovila sem, da se mladi premalo zavedajo vpliva mode oziroma medijev na naše življenje. Posvečajo ji preveč pozornosti, s tem pa se proizvede in proda prevelika količina oblačil, kar ima številne negativne posledice. Tekstilna industrija je tako polna črnih trenutkov, na katere vpliva človek z prekomernim nakupovanjem, ter vplivov medijev na širše populacije porabnikov. Ugotovitve do katerih sem prišla, govorijo v prid nakupu manj kosov kvalitetnejših oblačil. Tako bi lahko zmanjšali negativne učinke na zdravje posameznika in na okolje. Potrebno je preseči vpliv oglaševanja in osmisliti zmanjšanje neomejenega nakupovanja oblačil.

Summary:

Clothes have been accompanying us all our lives, we have worn them since the day we were born, and after all we are wrapped in the first piece of fabric only few minutes after birth. Because today life without clothes is practically impossible to imagine, I decided to research this subject matter in more detail. Do you ever wonder, where the clothes you wear came from, what kind of processes are used to make them, do they pollute the environment and at the same time possibly contain harmful substances? Have you ever noticed an unpleasant smell, when entering a store? Is there a difference in quality between easily accessible clothing and expensive ones? Which is more reasonable and right: buy more cheap pieces of clothing or just one, more expensive? To get the answers I have read relevant literature, interviews and performed practical experiments to determine the permeability of different pieces of clothing and the effect of clothing on chicken liver. I also conducted a survey that was publicly available on the website. I have found out that young people do not realize enough the influence of media and fashion on our lives. They pay too much attention to it, and by that there are produced and sold large amounts of clothing, which has many negative effects. The textile industry is so full of black moments which are affected by human with over shopping and the effect of the media on the wider consumer population. The findings lead me in favor of buying fewer pieces of better quality clothing. This could reduce the negative effects on the health of the individual and the environment. It is necessary to go beyond the influence of advertising and to reasonably reduce unlimited clothes shopping.

Ali lahko mladi z oblačenjem vplivamo na okolje?



Raziskovalka: Maja Kristovič, Nuša Malek

Mentorica: Marta Glatz

Šola: Osnovna šola Mladika

Recenzentka: Mojca Slana

Povzetek:

Oblačila so del našega vsakdana in nas spremljajo na vsakem koraku. Za to temo raziskovalne naloge sva se odločili, ker se nama je zdelo zanimivo in sva želeli ugotoviti, kako razmišljajo mladi ter kakšni so zares vplivi oblačil na okolje. S pomočjo literature sva v nalogi opisali materiale iz katerih so najpogosteje narejena oblačila, iz katerih držav prejemamo oblačila v Evropski uniji, izdelavo oblačil, omenili sva tudi modna oblačila, kulturni in zgodovinski pomen oblačil, kam z oblačili, ko jih ne potrebujemo več ter kako oblačila vplivajo na okolje.

V raziskovalnem delu naloge sva se odločili narediti anketo, s katero sva želeli dobiti odgovore na najina vprašanja. Anketni vprašalnik sva naredili premišljeno in čim bolj zanimiv učencem. Anketo so reševali učenci OŠ Mladika od 7. razreda do 9. razreda ter dijaki 4. letnika Gimnazije na Ptuju. Med pregledovanjem anket, kar nama je vzelo kar nekaj časa, sva se zelo zabavali, saj so nekateri učenci pisali zelo zanimive odgovore. Nekaterne najine domneve so se potrdile, druge pa ne. Z anketo sva ugotavljali, kako mladi razmišljajo o oblačilih ter kakšna je razlika med razmišljanjem učencev in dijakov. Glede na to, da so gimnazijci starejši, sva pričakovali, da dijaki razmišljajo bolj zrelo kot osnovnošolci, kar se je tudi potrdilo. Z raziskovanjem sva pridobili veliko novih informacij in pogled z druge strani. Sedaj sva tudi sami bolj ozavešeni in pazljivi pri oblačilih.

Summary:

Clothes are part of our daily lives and accompany us every step of the way. We chose this area of research, because we found it interesting and wanted to find out how young people think and what the environmental impact of clothing is. With the help of literature, we described the most commonly used materials, which countries import clothing to the European Union and the production of clothing. We also mentioned fashion and trendy clothing, the cultural and historical significance of clothing, as well as where to bring them, when we no longer need them and how clothing affects the environment.

In the research part of the assignment, we decided to do a survey in order to get answers to our questions. We made the questionnaire interesting and challenging for the students. The survey was taken by pupils from Mladika elementary school from 7th to 9th grade, as well as by the students of the 4th year Grammar School in Ptuj. We had a lot of fun while going through the surveys, which took us quite a while, as some students wrote very interesting answers. Some of our assumptions were confirmed, others were not. The survey was used to find out what young people think about clothing and the difference between the opinion of students and pupils. Given that high school students are older, we expected them to think more maturely than elementary school students, which was confirmed. Through the research, we have gained a lot of new information and a view from the opposing side. We are now more self-aware and careful when it comes to clothing.

Čebelarjenje v lokalni skupnosti



Raziskovalci: Maša Fras, Sara Merc, Vid Petrovič

Mentorica: mag. Aleksandra Čeh

Šola: Osnovna šola Markovci

Recenzentka: mag. Mojca Metličar

Povzetek:

Za raziskovalno nalogo »Čebelarjenje v lokalni skupnosti« smo se odločili, da opozorimo na pomen čebel, ki ga imajo v svetu in da bolje spoznamo našo avtohtono čebelo – Kranjsko sivko. Kranjska sivka je zelo delavna, mirna in žilava živalca, zato je zelo prijetno delati z njo, trdijo naši lokalni čebelarji. Njena naloga ni samo nabiranje medicinine in cvetnega prahu, ampak skrbi tudi za oprasovanje cvetja in drevja. Čebele in drugi oprasovalci že milijone let skrbijo, da je naša prehrana raznolika, ohranjajo biotsko raznovrstnost ter živahen ekosistem. Danes so oprasovalci ogroženi zaradi invazijskega kmetijstva, negativni vpliv imajo tudi podnebne spremembe. Višje temperature, suše, poplave, drugi ekstremni podnebni dogodki in spremembe časa cvetenja zavirajo oprasovanje. ČD Markovci je s svojimi akcijami o zavedanju pomena in tudi perečega problema o ogroženosti teh malih bitij veliko storila na tem področju. Od lokalnih čebelarjev smo izvedeli tudi o boleznih, ki pestijo čebele. Največ težav imajo z varojo, ki je k nam prišla iz Azije. S čebelarji smo se pogovarjali tudi o dragocenih čebeljih pridelkih, ki so popolnoma naravna živila in primerna hrana za vse hitrejši način sodobnega življenja, saj imajo veliko zdravih učinkov. Zanimalo nas je tudi koliko imajo čebel, koliko medu in drugih čebeljih pridelkov nastane v njihovih panjih ter ali je čebelarjenje dobičkonosen posel. Izvedeli smo, da največ pridelajo cvetličnega medu glede na lego čebelnjaka in da je naša občina prijazna čebelam, ker spodbuja čebelarski turizem. ČD Markovci skupaj z Občino Markovci se trudita razvijati čebelarski turizem, za katerega bi želeli tudi mi navdušiti širšo populacijo in širiti zavest o pomembnosti čebel. Čebele so fascinantne in če za njih lepo skrbimo, bomo poskrbeli tudi za naš planet in navsezadnje za nas.

Summary:

We decided to write the research paper titled »Beekeeping in a local community« because we wanted to point out the global importance of bees, and to get more familiar with our native bee – the Carniolan grey bee. The Carniolan grey bee is a hardworking, docile and tough animal, so it is nice to work with it, as our local beekeepers always say. Beside collecting nectar and pollen, Carniolan bees also pollinate flowers and trees. Bees and other insect pollinators have taken care of the diversity of our food, of the preservation of biodiversity and of the diversity of our ecosystems for million years. At present, pollinators are under great threat from intensive agriculture, as well as effects of climate change. Higher temperatures, droughts, floods, other extreme climatic phenomena, and changes in flowering periods have negative impact on pollination. The members of beekeeping society ČD Markovci have done a lot to make people aware of the importance of bees, as well as to inform them how seriously threaten these little beings are. Local beekeepers told us about diseases that affect honeybees. The most common one is Varroa destructor, which originally only occurred in Asia. With the beekeepers, we also talked about precious bee products, which are completely natural foodstuffs. They are perfectly suitable for our increasing pace of life, as they have many medicinal properties. We also wanted to know how many bees they had, how much honey and other bee products were produced in their beehives, and if beekeeping was a profitable business. We found out that due to the position of the beehive, they produce mostly floral honey and that our municipality encourages beekeeping, as well as beekeeping tourism.

Izvedba merilnega vmesnika z Arduino mikroprocesorskim sistemom



Raziskovalec: Tomi Polanec

Mentor: Franc Vrbančič

Šola: Šolski center Ptuj, Elektro in računalniška šola

Recenzent: Daniel Tement

Povzetek:

Dandanes so mikroprocesorji vsepovsod – od telefona do moderne pečice. Odločili smo se to področje podrobneje raziskati. Najprej smo proučili, kaj je že znanega na tem področju. Pomagali smo si s pisnimi in drugimi viri. Ugotovitve smo uporabili za načrtovanje, izvedbo in preizkus merilnega vmesnika. Pri oblikovanju naprave smo najprej določili njene funkcionalnosti, čemur je sledilo naročilo elementov ter študija elektronsko-programске opreme in izvedba te. Na koncu smo po vnaprej določenih postopkih in kriterijih napravo preizkusili ter podali mnenje o ustreznosti naprave za merjenje temperature, zračne vlage in osvetljenosti.

Summary:

Nowadays microprocessors are everywhere - from the phone to the modern oven. We decided to investigate this area in more detail. First, we looked at what is already known in the field. We helped ourselves with written and other resources. The findings were used to design, implement, and test the data acquisition system. By designing the device, we first determined its functionality, followed by the ordering of the elements and the study of the hardware - software components and finally we implemented it. According to predefined procedures and criteria, we tested the device and gave an opinion on the suitability of the device to measure the temperature, humidity and brightness of a area.

DRUGA PODROČJA

Kaj imajo skupnega šport, matematika in logika?



Raziskovalke: Nina Horvat, Daša Polanec, Ana Potočnik

Mentorja: Urška Jaroš, Drago Prelog

Šola: Osnovna šola Destrnik-Trnovska vas

Recenzent: Boštjan Koletnik

Povzetek:

Z raziskovalno nalogo smo želeli ugotoviti, ali obstaja povezanost med povprečno oceno učencev iz znanja matematike ob polletju, rezultati merskih nalog gibalne sposobnosti koordinacije ter rezultati preverjanja znanja iz logičnega mišljenja. Ugotoviti smo tudi želeli, kakšna je razlika med spoloma, razredom in statusom učenca. Zanimalo nas je, ali bodo učenci po pettedenski dodatni vadbi za izboljšanje gibalne sposobnosti koordinacije imeli večji napredek v rezultatih merskih nalog kot učenci, ki te vadbe niso imeli, in v katerem razredu bo ta napredek največji. V raziskavi je sodelovalo 111 učencev in učenk, ki obiskujejo četrty, peti in šesti razred Osnovne šole Destrnik-Trnovska vas. Razdelili smo jih v eksperimentalno in kontrolno skupino. Izbrali smo pet merskih nalog za merjenje gibalne sposobnosti koordinacije: poligon nazaj, taping z roko, taping z nogo, bočne poskoke in test agilnosti. Načrtovali smo pettedensko 10-minutno vadbo, ki so jo učitelji športa izvajali pri rednih urah pouka v eksperimentalni skupini. Kontrolna skupina dodatne vadbe ni izvajala. Po končani pettedenski vadbi smo ponovili testiranje. Po pridobljenih ocenah iz programa eAsistent smo izračunali povprečno oceno iz matematike ob polletju. Za vsak razred smo sestavili ustrezno preverjanje znanja iz logičnega mišljenja, ki so ga učenci pisali na uri oddelčne skupnosti. Učitelji matematike so učence razdelili glede na njihov status: na učence z učnimi težavami, povprečne in nadpovprečne učence. Rezultate smo obdelali s pomočjo programa Excel in programa SPSS. Rezultati so pokazali, da je eksperimentalna skupina dosegla veliko večji napredek od kontrolne skupine v vseh merskih nalogah. Učenci četrtega razreda so zabeležili največji napredek v tapingu z roko in poligonu nazaj, učenci petega razreda v bočnih poskokih in tapingu z nogo, v šestem razredu pa se je pokazal največji napredek v testu agilnosti. Rezultati kažejo, da obstaja statistično pomembna povezanost med povprečno oceno iz matematike ob polletju in rezultati merskih nalog poligon nazaj in taping z nogo. Slednja naloga kaže povezanost tudi s preverjanjem znanja iz logičnega mišljenja. V rezultatih se niso pokazale razlike med spoloma. Najslabše rezultate v merskih nalogah gibalne sposobnosti koordinacije so dosegli učenci z učnimi težavami.

Summary:

The aim of this research paper was to find out whether there is a connection between the average grade in Maths at half term, the results of measuring the motoric skill of coordination and the results of testing the knowledge of logical thinking. We were also interested in finding out whether there is a gender-, class- or status-based difference. Furthermore, we were interested whether the pupils who have undergone a five-week extra practice to improve their motoric skill of coordination will show a bigger progress solving the tasks in comparison to those pupils who haven't undergone the extra practice, as well as in which class the progress will be the most evident. 111 pupils who visit classes 4, 5 and 6 at Primary school Destrnik-Trnovska vas have participated in the research. They were divided into the experimental and the control group. Five tasks to measure the motoric skill of coordination were chosen: mastering the training ground backwards, tapping with the hand, tapping with the foot, side to side hops and testing agility. For five weeks the teachers of Sports have carried out a ten minute practice during their regular lessons in the experimental group. The control group hasn't undergone the practice. After the five weeks were over, we have repeated the testing. According to the grades which we have obtained in the programme eAsistent, the average grade in Maths at half term has been calculated. For each class we have prepared an appropriate exam to test their knowledge of logical thinking which the pupils then wrote during class lessons. The teachers of Maths have divided the pupils according to their status: the pupils with learning disabilities, the average pupils and the above-average pupils. The results have been processed in the programmes Excel and SPSS. The results show that the experimental group has achieved a much bigger progress in all the tasks than the control group. Class 4 pupils show the biggest progress in the hand tapping and mastering the training ground backwards tasks, class 5 pupils in side to side hops and the foot tapping tasks, and class 6 pupils in the agility test. The results indicate that there is a statistically significant connection between the average grade in Maths at half term and the results of mastering the training ground backwards and foot tapping tasks. In addition, the latter task also indicates a connection to testing the knowledge of logical thinking. In the results no gender-based difference arises. The pupils with learning disabilities have the worst results when measuring the motoric skill of coordination. a chair is the one that enables movement - dynamic sitting.

Vpliv telesne aktivnosti na srčni utrip in telesno težo



Raziskovalki: Jana Železnik, Ana Marija Gajšek

Mentor: Benjamin Lipnik

Šola: Osnovna šola Žetale

Recenzent: Boštjan Koletnik

Povzetek:

Namen raziskovalnega dela je bil ugotoviti vplive telesne dejavnosti na merjenki. Zanimalo nas je, ali povečana telesna dejavnost vpliva na zmanjšanje telesne teže in zmanjšanje srčnega utripa v mirovanju. Raziskovalna naloga je raziskovalnega tipa. V raziskavo sva bili vključeni obe avtorici. Raziskava je trajala 2 meseca in je potekala v dveh delih. V prvem delu sva imeli merjenki zmanjšano, v drugem delu pa povečano telesno aktivnost (od štiri do pet aktivnosti tedensko). Vsak dan sva si v dnevnik večkrat dnevno beležili telesno težo, srčni utrip v mirovanju in količino ter vrsto telesne aktivnosti. Dobljene podatke smo obdelali s pomočjo računalniškega programa Microsoft Office Excel 2010. Ugotovili smo, da je povečana telesna aktivnost vplivala na merjenki. Nekoliko se je znižala telesna teža, prav tako pa se je nekoliko zmanjšal tudi srčni utrip v mirovanju. Redna telesna aktivnost je ugodno vplivala predvsem na splošno počutje merjenk.

Summary:

The purpose of the research is to determine the influence of physical activity on the persons measured. We wanted to determine whether average physical activity influences the loss of body weight and reduction of heart rate at rest. The type of research is empirical. Both authors have been included in the research. The research lasted for two months and was held in two parts. In the first part of the research, both persons measured have had reduced physical activity and in the second part we have had increased physical activity (four to five activities per week). In a journal we kept record of our body weight, heart rate in rest and the amount and type of physical activity. Information gained were processed by a computer program Microsoft Excel 2010. We determined that increased physical activity influenced both persons measured. Our body weight and heart rate in rest were slightly reduced. Regular physical activity mainly influenced our general well-being.

Kriva je luna



Raziskovalki: Lana Krošel, Alja Šela

Mentorica: Ines Jarh

Šola: Osnovna šola Gustava Šiliha Laporje

Recenzentka: Anja Potočnik

Povzetek:

V svetu 21. stoletja, polnem znanstvenih raziskav, kjer naša domišljija postaja resničnost, ko je vsak atom že raziskan, še vedno obstajajo stvari in pojmi, za katere nismo čisto prepričani, kako delujejo in kje iskati vzroke za to. Eno izmed teh področij je zagotovo vpliv vesolja na delovanje človeka. Zato sva se odločili, da poskušava raziskati, ali ima polna luna vpliv na človeka ali je mogoče to le mit, ki je preživel stoletja iz časov, ko si pojavov in dogodkov niso znali razložiti. Da bi lahko našli dokaze za to, sva se zatekli k statistiki prometnih nesreč na območju PU Maribor za leti 2017 in 2018. Kljub temu da si tudi znanstveniki niso čisto edini, kakšen, če sploh kakšen, vpliv ima Luna na človekovo delovanje, sva prišli do zanimivih ugotovitev, iz katerih bi se dalo sklepati, da Luna vpliva na človeka vsaj pri vožnji.

Summary:

In 21st century, in world full of scientific research, where our imagination is becoming reality, where every atom is explored, there are still things and concepts for which we are not sure how they work and where to look for the reasons for them. One of these fields is the influence of the Universe on humans functioning. That is why we chose this to be the theme of our research paper, to research whether or not the full moon has influence on humans or is this just a myth, that survived centuries, from times they could not explain the phenomenon or events that occurred. To find evidence for that, we looked up the statistic records of the traffic accidents in the police station area of Maribor for years 2017 and 2018. Although the scientists do not quite agree on the influence the Moon has, if any, we came to some interesting conclusions, which indicate that the Moon has some influence on humans, at least while driving.

Pasja vzgoja skozi pozitivno motivacijo



Raziskovalka: Tjaša Petrovič

Mentorica: Mihaela Cajnko Gojkošek

Šola: Osnovna šola Mladika

Recenzentka: Anja Potočnik

Povzetek:

V raziskovalni nalogi bom podrobno predstavila sistem pozitivne motivacije slovenskega zavoda za vzgojo psov Alfakan. Za lažje razumevanje celotnega sistema, se bom poglobila predvsem v naravo in v psihologijo psov. Odločila sem se raziskati takšen način dela, s katerim zelena vedenja nagradujemo, neželena vedenja pa že preprečimo, saj menim, da z ustrahovanjem psa in uporabo sile do zelenih vedenj na dolgi rok ne bo prišlo.

Namen raziskave je ozaveščanje vodnikov psov in tistih, ki se za psa šele odločajo, o smiselnih in humanih pristopih k pasji vzgoji.

Pri raziskovanju mi je bil v pomoč intervju z inštruktorico Zavoda za vzgojo psov Alfakan, Manco Smolnikar, ki ima tudi lastne izkušnje z reaktivnostjo. Opravila sem spletno anketo, ki sem jo izvedla med Alfakanovimi tečajniki.

Pridobila sem veliko novega znanja na področju pasje psihologije in vzgoje. Moja glavna ugotovitev je, da se vedno več ljudi odloča za sistem pozitivne motivacije, ker prinaša rezultate na dolgi rok, gradi na povezavi med lastnikom in psom in najpomembnejše, pes uživa v delu in aktivnostih z lastnikom.

Summary:

In this research project, we will describe the system of positive motivation, created by the Slovenian institute for dog training Alfakan. For a better understanding of the whole system, we will above all, research the nature and psychology of dogs. We have decided to research dog training, which rewards correct behaviour and prevents unwanted behaviour. We think that, scaring a dog and using force will perhaps lead to positive results, however only after a longer period is and thus not considered an appropriate manner to change dog behaviour.

The purpose of this research is raising awareness to dog owners and people, who are still deciding whether to get a dog, as well as meaningful and humane approaches to dog training.

During the research I conducted an interview with a dog instructor at Alfakan, Manca Smolnikar, who also has own experiences with reactivity. I also made an online survey for Alfakan students.

I gained a lot of knowledge on dog psychology and training. My main conclusion is that many people are deciding to work with the system of positive motivation, because it brings results for a long period, it strengthens the bond between owners and dogs and most importantly, dogs enjoy working and different activities with owners.

Meh za znanje, srečo in smeh



Raziskovalke: Lara Tekmec, Luka Šlamberger, Jure Glažar

Mentorica: Marija Meklav

Šola: Osnovna šola Hajdina

Recenzentka: Neža Tement

Povzetek:

V raziskovalni nalogi smo se omejili na zgodovino harmonike, njeno sestavo, zanimalo nas je tudi, v katerih glasbenih zvrsteh se največkrat pojavlja. Prav tako predstavljamo kratko zgodovino glasbene skupine Štajerski frajtonarji, ki delujejo pod okriljem Kulturnega društva Valentina Žumra, katerega ustanovitelj je Alfonz Strnad.

Naloga je sestavljena iz teoretičnega in raziskovalnega dela. V prvem je poleg uvoda opisana celotna predstavitev teme. V drugem – raziskovalnem delu pa je predstavljena analiza ankete, iz katere je razvidno vedenje o harmoniki in Štajerskih frajtonarjih. Ugotavljali smo tudi, kaj vse rabimo za izdelavo, predvsem pa, kakšen umetniški, skoraj znanstveni pristop je potreben, da harmonika izzove zvok, ki navdušuje množice. Zato smo se oglasili v delavnici gospoda Zlatka Munda, ki nam je ogled procesa izdelave harmonike tudi omogočil.

Skozi predstavitev bomo posegali po najrazličnejših zgodbah in intervjuju, hkrati pa upoštevali strokovne poglede na zgodovinska dejstva. Vsebinsko naše raziskovalne naloge bi želeli približati našim sovrstnikom, saj je frajtonarica med mladimi vedno bolj priljubljena.

Summary:

Our paper focuses on the history of the accordion, its composition, and also the musical genres it most often appears in. A brief history of the "Štajerski frajtonerji" music group, which operates under the patronage of the Valentin Žumer Cultural Society, founded by Alfonz Strnad, is also presented. The paper consists of theoretical and research work. The theoretical part besides the introduction describes the complete presentation of the topic. The research part presents the analysis of the survey that shows the general knowledge of the accordion and "Štajerski frajtonerji". We also tried to find out what we need to make an accordion and most of all, what artistic, almost scientific approach is required for the accordion to evoke a crowd-pleasing sound.

That is why we went to the accordion workshop run by Mr. Zlatko Munda, who also gave us an overview of this production process. Throughout the presentation, we will reach out to a wide variety of stories and interviews, while taking expert views of historical facts into account. We would like to bring the content of our paper closer to our peers, as a Steirische Harmonika (a type of bisonoric diatonic button accordion) is a very interesting and beautiful instrument.

Robot ali človek?



Raziskovalki: Neli Gošnjak, Neža Štandeker

Mentorja: Vesna Potočnik, Luka Husu

Šola: 2. osnovna šola Slovenska Bistrica

Recenzentka: Anja Potočnik

Povzetek:

V tej raziskovalni nalogi sva raziskovali, kako roboti vplivajo na razvoj medicine, kako ji koristijo ter kaj bi bilo, če teh robotov ne bi imeli. Obiskali sva fakulteto za medicino v Mariboru, kjer so nama predstavili simulatorje, na katerih se študentje učijo. Spoznali sva, da so ti simulatorji za medicino zelo pomembni, saj se na njih študentje naučijo, kako odreagirati v kritičnih situacijah. Predstavili sva razne zaplete, ki se lahko zgodijo v vsakdanjem življenju, npr. zamašitev srčne žile, zastoj srca. Poglobili sva se tudi na problem čakalnih vrst, ki so v Sloveniji kar dolge. Ugotovili sva, da ministrstvo za zdravje vlaga premalo sredstev, da bi se čakalne vrste zmanjševale, kajti roboti jih ne zmanjšujejo. Skozi vso raziskovalno nalogo sva dokazali izreden pomen robotov v zdravstvu, razmišljali, kako bi lahko bilo v prihodnosti, ter kako je bilo včasih.

Summary:

In this research paper we explored how robots influence the development of medicine, how it benefits and what it would be like if these robots were not available. We visited Medicinska fakulteta Univerze v Mariboru where they demonstrated medical simulators where students study and practice. We have learned that these simulators are very important for medical students as they learn how to react in critical situations. We have presented different medical complications that can occur in everyday life, for example the clogged arteries or cardiac arrest. We also looked at queues which are quite long in Slovenia. We found that the Ministry of Health is investing too little in order to reduce queues, because robots do not reduce them. Throughout our research paper we proved significance of robots in medicine. We also talked about how it might be in the future and how it used to be in the past.



Sloveniaring Ormož

Raziskovalci: Noel Arnuš, Tjaš Notersberg, Jure Rudolf

Mentorici: Janja Rudolf, Nataša Kolar

Šola: Osnovna šola Ormož

Recenzentka: Robert Novak

Povzetek:

Možnosti za profesionalno ali ljubiteljsko ukvarjanje z avtomobilističnimi ali motorističnimi športi so v Sloveniji zelo omejene, ker kljub pobudam še vedno nimamo za to primerne objekta. To nas je pripeljalo do ideje, da bi pripravili načrt za izgradnjo vrhunskega dirkališča v Ormožu. Za lokacijo smo izbrali zapuščeno območje glinokopa, ki je dovolj oddaljeno od mesta, a kljub temu dobro dostopno. Z izgradnjo takega objekta bi Občina Ormož pridobila prepoznavnost doma in v tujini ter različne poslovne priložnosti za različne gospodarske panoge v regiji. Načrt smo ročno narisali na dejanske fotografije lokacije. Risali smo ga tako, da smo postopno dodajali objekte, posebej pa smo narisali ciljno ravnino. Tloris smo narisali z računalniškim programom Inkscape 0.92.

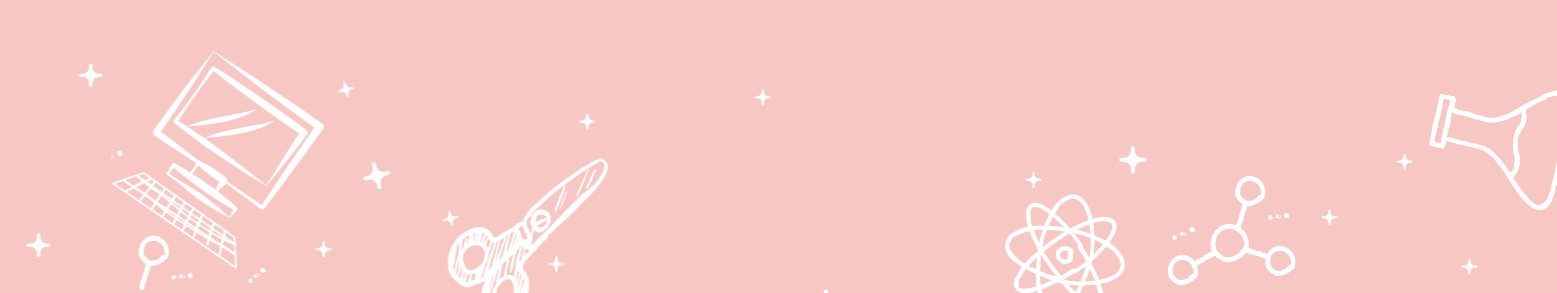
Želeli smo izvedeti, ali bi občani različnih starostnih skupin podprli idejo o gradnji dirkališča in njihovo mnenje o pomenu take vrste objekta za Občino Ormož. Zanimalo nas je tudi njihovo poznavanje podobnih objektov doma in v tujini ter njihovi predlogi za obuditev glinokopa. Za mnenje o ideji smo zaprosili župana Občine Ormož Danijela Vrbnjaka in dopisnika iz avtomobilskih tekmovalj Milana Klemenca. Možnost uporabe takega objekta in mnenje smo preverili pri direktorju Avtocentra Ormož Jerneju Bratuši.

V raziskovalni nalogi smo uporabili metodo analize virov, metodo anketiranja, intervju, risanje na dejanske fotografije in računalniški program Inkscape 0.92.

Summary:

Opportunities for engaging in professional or amateur motor sports or motorcycle sports are very limited in Slovenia because we still do not have a suitable facility with a racetrack despite individual initiatives. This led us to the idea to make a layout for building a superb racetrack in Ormož. For the location, we have chosen an abandoned clay pit area that is far enough from the city but still accessible. By constructing such a facility the Municipality of Ormož would gain visibility and recognition in Slovenia and abroad as well as different business opportunities for various industries in the region. We have drawn the layout manually on the actual location photographs. We drew it by gradually adding objects and drawing the finish line separately. The layout was drawn with the computer program Inkscape 0.92. We wanted to find out if citizens of different age groups would support the idea of building a race track and their opinion on the importance of this type of facility for the Municipality of Ormož. We were also interested in their knowledge of similar facilities in Slovenia and abroad and their suggestions for the revival of the clay pit. We wanted to know the opinion of Danijel Vrbnjak, the Mayor of Ormož, and of Milan Klemenc, a car racing correspondent. We checked the possibility of using such a facility with the director of the Auto Center Ormož Jernej Bratuša. In the research assignment we used the resource analysis method, the survey method, the interview, drawing on actual photographs and the computer program Inkscape 0.92.

ARHITEKTURA, GRADBENIŠTVO ALI PROMET



Iz pritličja v mansardo



Raziskovalka: Karla Rap

Mentorica: Renata Jesenek

Šola: Osnovna šola Gustava Šiliha Laporje

Recenzent: Robert Novak

Povzetek:

Za raziskovalno nalogo sem se odločila, ker me zanima arhitektura in rada iščem rešitve problemov, ki se pojavijo v hiši že med gradnjo ali kasneje pri preureditvi prostora. Hkrati pa sem v naši hiši opazila, da stopnice zavzamejo veliko prostora, in zanimalo me je, kako najbolj optimalno izkoristiti dani prostor za postavitve stopnic.

Namen moje raziskovalne naloge je bil najti rešitev za stopnice v kompleksnem prostoru, in sicer osrednjem bivalnem prostoru v leseni hiši, kjer je zaradi spremembe v gradnji nastal manjši prostor za stopnice, kot je bil sprva predviden. Tako je nastalo nekaj omejitev, ki so oteževale postavitve stopnic v prostoru. Investitor je naletel na težavo, saj mnogi izvajalci niso našli rešitve. Zanimalo me je, ali lahko sama najdem rešitev in izdelam maketo stopnic, ki bo upoštevala vse zahteve. Upoštevat je potrebno neobičajno višino pritličja, ki meri 286 cm, ob čemer se pod načrtovanimi stopnicami nahaja še lončena peč, ki v zimskem času povzroča velike temperaturne razlike. Prostor namenjen stopnicam zmanjša še leseni stropnik, ki dodatno zmanjša možnost za postavitve različnih stopnic. Po tem, ko sem preučila vse omejitve prostora, sem se lotila raziskovalnega dela.

V teoretičnem delu naloge sem najprej opisala zgodovino stopnic, nato materiale iz katerih so lahko stopnice izdelane. Posebno pozornost sem posvetila lesenim stopnicam in opisala vse vrste lesa, ki so primerne za izdelavo trpežnih stopnic v zaprtih prostorih. Nadalje sem stopnice delila glede na zasnovo in lego v prostoru, opisala sem dimenzije stopnic in vrste ograj. Navedla sem razmerje med višino in širino stopne ploskve, da bo hoja udobna. Razmišljala sem tudi o sušenju lesa, saj je pomembno, da se les minimalno krči in razteza.

V raziskovalnem delu naloge sem se lotila načrtovanja stopnic, tako da sem skicirala različne rešitve, ki bi ustrezale prostoru. Izbrala sem dve, po mojem mnenju najboljši možni rešitvi. Za lažjo predstavbo sem izdelala makete. Prostor sem načrtovala v računalniškem programu CiciCAD, načrt za izdelavo dveh maket stopnic pa sem izdelala v programu AutoCAD. Nato sem izdelala maketo prostora in peči iz vezane plošče in stiropora ter dve maketi stopnic, da bi lažje potrdila ali ovrгла hipoteze. Ob koncu sem izbrala najboljšo rešitev za postavitve stopnic v zapleteni prostorski situaciji. Ugotavljal sem, kakšna oblika stopnic je najbolj optimalna v zapleteni prostorski situaciji nad pečjo in pri katerih stopnicah je ekonomski vidik najugodnejši.

Summary:

I decided to do a research assignment because I am interested in architecture and I wanted to find solutions to problems that occur in the house during construction or later when remodelling a space. At the same time, I noticed in our house that the stairs take up a lot of space and I was interested in how to make the best use of the space provided for the stairs.

The purpose of my research assignment was to find a solution for stairs in a complex space. The space is the central living space in a wooden house, where a change in construction has created less space for stairs than originally intended. This created some restrictions that made it difficult to set the stairs in the room. The investor encountered a problem as many contractors did not find a solution. I was so interested to find out if I could find a solution on my own and create a model staircase that would meet all the requirements. It is necessary to take into account the unusual height of the ground floor, which measures 286 cm, while under the planned stairs there is also a pottery furnace, which in the winter causes great temperature differences. The space intended for the stairs is further reduced by the wooden ceiling, which further reduces the possibility of erecting different stairs. After examining all the limitations of the space, I began my research.

In the theoretical part of the thesis, I first described the history of the stairs, then the materials from which the stairs could be made. I paid special attention to wooden stairs and described all types of wood that are suitable for making durable stairs indoors. Further, I divided the stairs regarding the design and location of the room, and described the dimensions of the stairs and the types of railings. I have indicated the ratio of height to width of the step surface to make walking comfortable. I was also thinking about drying the wood, as it is important to minimize the wood shrinkage and stretch.

In the research part of the assignment, I started designing stairs by sketching different solutions that would fit the space. I chose two, in my opinion, the most possible solution. For better imagination, I made models. I planned the space in the CiciCAD computer program, and I made the plan for the production of two model steps in AutoCAD. I then designed a model of the space and the furnace from plywood and Styrofoam and two models of stairs to help confirm or refute the hypotheses. In the end, I chose the best solution for setting the stairs in a complex spatial situation. In the end, I tried to find out what kind of staircase is the most optimal solution in the complex spatial situation above the furnace and which stairs are the most economical aspect.



APLIKATIVNI INOVACIJSKI PREDLOGI IN PROJEKTI



Eksperimentalni rimski kamp Poetovio



Raziskovalki: Neja Gajzer, Ela Holc

Mentorja: dr. Renata Debeljak, Andrej Klasinc

Šola: Osnovna šola Olge Meglič Ptuj

Recenzentka: dr. Anamarija L. Mrgole

Povzetek:

V inovacijskem projektu z naslovom Eksperimentalni rimski kamp Poetovio sva želeli prikazati novost na področju raziskovanja rimske zgodovine.

Ptuj je v lanskem letu (2019) praznoval 1950 let svoje prve pisne omembe in tako pomemben dogodek, ki se je zgodil leta 69 n. št., ko je rimski zgodovinar Tacit prvič zapisal ime Poetovio, smo na Ptujju obeležili z najrazličnejšimi razstavami, prireditvami, muzikalom Poetovio, izdajo knjig idr.

Ptuj je torej zrastel na temeljih rimskega mesta, o čemer danes priča bogata arheološka zbirka. Ob tem pa na Štukih že nekaj let nastaja edinstven projekt – Rimski kamp Poetovio, ki se razprostira na več hektarjih. Kamp predstavlja posebnost v Sloveniji, saj česa podobnega še nimamo. Da pa le-ta ne bi bil sam sebi namen ali morda zgolj služil kot muzej na prostem, sva se ob prvem obisku le-tega odločili umestiti v ta prostor inovacijski projekt, ki bi obiskovalcem vseh starosti omogočil spoznavati rimsko zgodovino na eksperimentalen način – torej da udeleženci ne bi bili zgolj pasivni opazovalci in poslušalci, ampak aktivni ustvarjalci, ki bi se v raznolikih delavnicah poučili o rimski kulinariki, arhitekturi, gradbeništvu, pisavi, književnosti, bojevanju, mitologiji idr.

V teoretičnem delu sva opisali Ptuj v rimskem času, predstavili sva projekt Rimske igre in Rimski kamp Poetovio.

V empiričnem delu sva predstavili vsebino eksperimentalnega rimskega kampa, sestavljenega iz raznolikih delavnic. Izdelali sva letak z vsemi potrebnimi informacijami ter ga razposlali vsem slovenskim osnovnim in srednjim šolam, saj tak projekt ni samemu sebi namen, ampak je namenjen poučevanju, raziskovanju in spoznavanju rimske zgodovine »in situ«.

Summary:

In an innovation project entitled 'Poetovio Experimental Roman Camp', the authors want to showcase a novelty in the field of Roman history research.

In 2019, Ptuj celebrated 1950 years since it was first mentioned in writing by the Roman historian Tacitus. This important event has been acknowledged by various exhibitions, events, Poetovio musical, book publications and more.

Ptuj was set up on the foundations of a Roman city, which is evident by its rich archaeological collection. At the same time, a unique project has been underway in Štuki for several years - the Poetovio Roman Camp, which spans on several hectares of land. The campsite is quite unique as there is nothing alike to be found in Slovenia. The authors decided to place their innovation project within the camp so that the camp would not only serve as an open-air museum, but it would let visitors of all ages learn about Roman history in a more experimental way. This would allow the participants not only to be passive observers and listeners but active creators who would learn about Roman cuisine, architecture, construction, writing, literature, warfare, mythology, etc. in various workshops.

The theoretical part of this innovation project presents Ptuj in Roman times, the project Roman Games and the Poetovio Roman Camp.

The empirical part presents the contents of the Experimental Roman Camp consisting of various workshops. The authors have created a leaflet with all the necessary information, which they distributed to all Slovenian elementary and secondary schools as such project is intended for visitors to learn, research and get to know Roman history "in situ".



Kavalek



Raziskovalke: Maja Bokša, Ema Šoštarič, Ana Štibler

Mentorici: Mojca Bauman Kralj, Alenka Šalamon

Šola: Osnovna šola Ormož

Recenzent: dr. Anamarija L. Mrgole

Povzetek:

Sprehod skozi naše mesto, ki ga imamo rade in smo naj ponosne, nam razkriva kotičke, ki jih z veseljem delimo z bližnjimi, prijatelji in jih ponosno pokažemo tudi našim gostom in obiskovalcem. Obstajajo pa tudi takšni, ki nam niso v ponos, pa bi nam lahko bili. Govorimo o zapuščenih stavbah z bogato preteklostjo, ki je zapisana v spomine Ormožanov. Naša želja in želja marsikaterega krajana je, da bi katera teh stavb ponovno oživila in nam služila v vsakdanjem življenju.

Odločile smo se, da raziščemo preteklost stavbe stare lekarne v Ormožu, kakršna je v spominu Ormožanov, predstavimo svojo idejo o prenovi te stavbe in kakšen bi bil odziv med občani. Predstavile smo jim svojo zamisel o nastanku mladinske kavarne, ki bi bila hkrati stična točka različnih generacij za življenje v našem mestu.

V raziskovalni nalogi smo uporabile metodo analize literature, metodo anketiranja, intervju in ustvarile predloge s prostim risanjem lastnih idej.

Ugotovile smo, da je stavba v lastništvu dveh oseb, ki se nista odzvali na naše kontakte. Na občini smo s pomočjo intervjuja izvedele, da občina nima vpliva na prazne in zapuščene stavbe v kraju. Anketiranci, ki so sodelovali z nami, bi naše ideje o mladinski kavarni podprli, tudi sami pa imajo ideje, kaj bi lahko bilo v obstoječi stavbi. Tudi sogovorniki na občini bi našo zamisel podprli, če bi bili lastniki stavbe.

Summary:

Walking through our city, which we love and are proud of, reveals to us corners that we are happy to share with our loved ones, friends and proudly show them to our guests and visitors. There are also corners that we are not proud of, but could be. We are talking about abandoned buildings with a rich past, which is written in the memories of the people who live in Ormož. It is our wish and also a wish of many locals to make any of these buildings come to life again and serve us in our daily lives.

We decided to explore the past of the old pharmacy building in Ormož, what it is like in the memory of the people, to present our idea of renovating this building and what would be the response among the citizens. We presented to them our idea of creating a youth café that would be the touch point of different generations for living in our town.

In the research paper, we used the literature analysis method, the survey method, the interview, and created templates by free drawing our own ideas.

We found out that the building is owned by two people who did not respond to our contacts. Through the interview at the municipality we found out that the municipality has no effect on the vacant and abandoned buildings in the locality. The respondents who worked with us would support our ideas for a youth cafe, and also have ideas for what might be in the existing building. Also, interlocutors in the municipality would support our idea if they owned the building.

ELEKTROTEHNIKA, ELEKTRONIKA IN ROBOTIKA

Avtonomno vozilo



Raziskovalec: Žiga Belšak

Mentor: Franc Vrbančič

Šola: Šolski center Ptuj, Elektro in računalniška šola

Recenzent: dr. Martin Terbuc

Povzetek:

Avtonomnost v osnovi pomeni gibanje v 3D prostoru in času. Trenutno človeštvo, predvsem avtomobilska industrija, kar precej truda in denarja namenja tovrstnim raziskavam. Želijo čimprej narediti in kupcu ponuditi docela avtonomno vozilo. Določena avtonomnost je sicer že dosežena in se uporablja npr. v logistiki (skladišča, razkladanje ladij) in kmetijstvu. Povsem pa problem še ni zadovoljivo rešen.

V nalogi raziskujemo načrtovanje in izdelavo ter testiranje avtonomnega vozila. Podlaga za strojni nivo je Arduino sistem, ki je krmiljen z algoritmom napisanim v C++ programskem jeziku. Naš sistem obvlada naloge izogibanja oviram, odmikanje od roba mize, vklop luči in sledenje cesti (črti).

Glede na predznanje je bila naloga precej zahtevna, a smo jo kar zadovoljivo rešili. Testiranje posameznih nalog vozila so ocenjena uspešno, a izdelek kot celota je ocenjen z neuspešno. Algoritmov reševanja posameznih nalog pač nismo znali integrirati v izdelek tako, da bi reševanje posameznih nalog potekalo hkratno.

Summary:

Autonomy basically means mastering 3D space and time. At present, humanity, especially the car industry, is investing a great deal of effort and money into this kind of research. They want to make it as soon as possible and offer the customer a fully autonomous vehicle. Some autonomy has already been achieved and is used for example. in logistics (warehouses, ship unloading) and agriculture but today the problem is still not satisfactorily resolved.

This research is exploring the design and manufacture and testing of an autonomous vehicle. The basis for the hardware level is the Arduino system, which is controlled by an algorithm written in the C++ programming language. Our system handles the tasks of avoiding obstacles, moving away from the edge of the table, turning on the lights and following the road (line).

Given the background, the task was quite demanding, but we solved it satisfactorily. Testing of individual vehicle tasks has been evaluated successfully, but the product as a whole has been evaluated as unsuccessful. We just didn't know how to integrate algorithms for solving individual tasks into a product so that solving individual tasks would be done simultaneously.

Avtonomni robot z Arduino sistemom



Raziskovalec: Alen Cvetko

Mentor: Franc Vrbančič

Šola: ŠC Ptuj Elektro in računalniška šola

Recenzent: dr. Martin Terbuc

Povzetek:

Človeštvo že nekaj let poseduje in obvlada tehnologijo, s pomočjo katere je sposobno narediti avtomobil, ki se sposoben učinkovito in varno prepeljati tako človeka kot material. Kdaj bodo takšni avtomobili dosegljivi kupcem, je trenutno zgolj vprašanje časa.

Področje avtonomnosti je tudi moja glavna raziskovalna tema, v kateri bom to področje raziskal, izsledke pa uporabil za načrtovanje in izvedbo preprostega avtobota, ki bo "šibal" po mizi, iskal cestno-črto, ji sledil, se izogibal oviram in pazil, da ne pade v prepad.

Vse navedeno sem skušal izvesti s priporočili, ki veljajo za razvojno - raziskovalno delo. Potek dela in izsledke raziskave sem zapisali v tole poročilo.

Summary:

For several years, people has possessed and mastered the technology by which it is capable of making a car capable of transporting both human and material efficiently and safely. When such cars will be available to customers is currently only a matter of time.

Autonomy is also my main research topic, in which I will explore this area, and use my findings to design and execute a simple autobot that will "whip" across the table, find the road - the black line on white board, follow it, avoid obstacles, and make sure does not fall into the abyss.

I tried to implement all of the above with recommendations that apply to R&D work. I have written the work progress and the findings of this research in this report.

Izdelava robotske roke



Raziskovalec: Leon Panič

Mentor: Miran Lazar

Šola: ŠC Ptuj Elektro in računalniška šola

Recenzent: dr. Martin Terbuc

Povzetek:

Cilj moje naloge je bila izdelava robotske roke, ki prikazuje najlažji način programiranja robotov. Izdelava robota ni bila lahka, saj sem se velikokrat znašel v zadregi in nisem vedel kako naprej. Ampak nisem obupal, saj sem s trdom in vztrajnostjo prišel do izdelka, na katerega sem ponosen.

Ob izdelavi robotske roke sem pridobil veliko tehničnih vrlin, naučil sem se programiranje v C programskem jeziku, izdelovati in programirati android aplikacije, risanje načrtov v orodjih: SolidWorks, Fritzing ter MIT app inventor, uporabljati Arduino mikrokrmilnike ter mnoge druge, ki mi bodo prišle prav v nadaljnji poklicni poti in življenju. Pridobil sem pomembno vrednoto reševanja problemov, ki mi bo pomagala ter koristila v celotnem življenju.

Sama sestava robotske roke je bila zahtevna, večji del sestave sem opravil na izmenjavi v Freiburgu, programiranje in izdelava android aplikacije pa dolgotrajna. Pred računalnikom sem presedel več ur na dan in se veselil vsakega napredka. Program sem izdeloval korak po korak in tako je sledila tudi android aplikacija. Na koncu sem dodal lepotne elemente, ki so celotnemu izdelku dali bolj dokončan videz. Z dokončano robotsko roko sem zelo zadovoljen, najbolj pa me veseli to, da sem pridobil novo znanje.

Summary:

The aim of my assignment was to build a robotic hand showing the easiest way of programming robots. It was not an easy task and I encountered numerous problems. But I did not give up and built a product I am proud of.

I have gained a lot of technical skills, learned C programming language, how to program and build android applications. I also learned how to draw plans using different tools such as SolidWorks, Fritzing and MIT App inventor as well as how to use Arduino microcontrollers. Above all I learned how to solve problems which will help me in my professional career.

The structure of the robotic hand was quite demanding, the major part of it was done during my exchange in Freiburg. I spent many hours a day behind my computer screen. The program was written step by step and so was the android application. Finally decoration elements were added to make the product more appealing. I am very satisfied with my product and all the knowledge I have gained.

RAČUNALNIŠTVO ALI TELEKOMUNIKACIJE

Aplikacija KEŠ



Raziskovalka: Noa Tušek

Mentor: Luka Husu

Šola: 2. osnovna šola Slovenska Bistrica

Recenzent: Daniel Tement

Povzetek:

Moj projekt je aplikacija KEŠ. V projekt so vključeni mladostniki, podjetja, firme,... in odrasli. Mladostniki dandanes preživijo preveč časa na pametnih napravah. Z uporabo aplikacije KEŠ bo čas porabljen koristno. Prav tako veliko mladostnikov ne prejema žepnine, z uporabo aplikacije KEŠ, bi mladi lahko prišli do nekaj evrov. Ključno vprašanje pri načrtovanju aplikacije KEŠ je bilo: »Kako bi mladi lahko prišli do denarja?« Aplikacija KEŠ bi delovala na osnovi anket. Ankete bi izdelovala podjetja, firme,... z željo po mnenju mladih glede njihovih produktov. Podjetja, firme,... bi v zameno za rezultate anket sponzorirale oz. financirale aplikacijo. Mladostniki oz. uporabniki aplikacije bi reševali ankete in preko anket povedali svoje mnenje. V zameno za reševanje anket pa bi dobivali žepnino, ki gre iz sredstev, ki bi jih podjetja, firme,... nakazale aplikaciji. Aplikacija KEŠ omogoča, da vsaj nekaj časa, ki ga mladi preživijo na pametnih napravah, preživijo koristno in pri tem dobivajo žepnino. Prav tako je super rešitev za podjetja, firme, ki rabijo zelo iskano mnenje mladih in starejših potrošnikov.

Summary:

Today adolescents spend far too much time with smart devices. No one can change this fact. However, time spent on smart devices can be useful for both the adolescent and the company. This project is a KEŠ application. This project involves young people, companies and adults. We all know that many parents and relatives cannot afford to give their children pocket money. The key question in designing the KEŠ app was, "How could young people earn money?". This app is a project that will involve businesses and consumers. Teens and other consumers will be able to download the app from the app store. They will solve surveys for different companies. Companies will pay something in return for the results. The KEŠ app allows at least some of the time that young people spend on smart devices to spend their useful life while getting pocket money. It is also a great solution for companies, that need feedback of young people and other consumers.

Reševanje igre Sudoku z umetno inteligenco



Raziskovalec: Simon Plazar

Mentorja: dr. Bojan Ploj

Šola: Šolski center Ptuj, Elektro in računalniška šola

Recenzent: Daniel Tement

Povzetek:

Danes je umetna inteligenca (UI) prisotna v mnogih pametnih napravah. Uporablja se vse od reševanja raznolikih problemov, do igranja iger, kot sta Go in Šah. Zanimalo me je, če je UI zmožen rešiti igro Sudoku. Uporabljal sem program Weka, ki mi je omogočal uporabo različnih vrst umetne inteligence. Naučil sem se grajenja arff datoteke, ki je potrebna za vnašanje podatkov v program Weka. Arff datoteko sem napolnil s številnimi učnimi primeri, ki so sestavljeni iz nerešenega in rešenega primera igre. S pomočjo Excel dokumenta sem pridobil veliko število učnih primerov v kratkem času. S tehnikami preslikave sem dobil iz enega učnega primera igre veliko učnih primerov. Raziskovalno nalogo sem začel z manjšo različico igre velikosti 4 x 4, kasneje pa napredoval na večjo različico velikosti 9 x 9. Ugotovil sem, da število učnih primerov pomembno vpliva na rezultat, ter da ni vsaka UI primerna za vsak problem, ki ga poskušamo rešiti.

Summary:

Today, artificial intelligence (AI) is present in almost all of our smart devices. It is used for everything from problem solving to playing board games such as Go and Chess. I was wondering if AI is able to solve a game of Sudoku. I used a program named Weka, that allowed me to use various types of artificial intelligence. I learned how to build an arff file which allowed me to enter data into the Weka program. I filled the Arff file with a large number of learning examples. Each learning example consisted of an unsolved and solved game example. I have acquired a large number of teaching examples in a short time, using mapping techniques, in an Excel document. I started my research assignment with a smaller version of the game with the size 4 x 4, and later progressed to the larger version of the game size 9 x 9. In my research, I found out, that the number of learning examples has a big impact on the results and that not every AI is appropriate for every problem we try to solve.

TEHNIKA ALI TEHNOLOGIJA

Začetne fotografske tehnike z »LEGO« kamero lastne izdelave



Raziskovalka: Iva Plavec

Mentor: dr. Andrej Šafhalter

Šola: Osnovna šola Anice Černejeve Makole

Recenzentka: dr. Dragica Pešaković

Povzetek:

V teoretičnem delu raziskovalne naloge sem preučila zgodovinski razvoj fotografije in njene začetke v svetu in v Sloveniji. Raziskala sem sisteme delovanja fotografskih kamer skozi zgodovino. Predstavila sem fotografske tehnike, predvsem pa sem se osredotočila na kvaliteto fotografij, ki sem jih posnela. Seznanila sem se z različnimi fotografskimi kamerami iz preteklosti in sedanjosti.

V empiričnem delu naloge sem ugotavljala, ali lahko sestavim fotografski aparat iz lego gradnikov kar doma. Pri delu sem se srečevala z različnimi izzivi in problemi, ki sem jih uspešno rešila. Velik izziv mi je predstavljala izdelava kasete za fotografski papir, na različne načine sem poskušala fotografski papir obdržati v kaseti. S kamero sem poskušala posneti kar najboljšo črno-belo fotografijo. Fotografije sem posnela pri različnih pogojih in jih med seboj primerjala ter ugotavljala, pri katerih pogojih so fotografije najkvalitetnejše.

Summary:

In the theoretical part of the research paper, I examined the historical development of photography and its beginnings in the world and in Slovenia. I explored the operation of some photographic camera systems throughout history and introduced photography techniques focusing primarily on the quality of photographs taken with large format cameras over hundred years ago.

In the empirical part of the paper, I was determining whether I could assemble a large-format photographic camera from Lego building blocks by myself. At work, I was confronted with various challenges and problems that I solved more or less successfully. Making the photo paper cassette where I tried to keep the paper in the cassette in different ways was a challenge. I took black-and-white photos with the camera under different conditions, compared them, and found out what conditions the best quality photos are made at. I made the photos in the dark as photographers did over hundred years ago. The only difference was that I used light-sensitive photo paper instead of glass.

Retro se vrača



Raziskovalca: Tim Perkovič, Anže Pregl

Mentor: Igor Keber

Šola: 2.osnovna šola Slovenska Bistrica

Recenzentka: dr. Dragica Pešaković

Povzetek:

Kolo kot prevozno sredstvo je zagotovo eno popularnejših, hitrih in preprostih prevoznih sredstev na svetu. Otroci zelo hitro začnejo poganjati pedala, uradno in samostojno pa kolo lahko uporabljajo z opravljenim kolesarskim izpitom. Tudi midva sva šla po tej poti. Kolo nama omogoča neodvisnost od staršev, prav tako se zavedava, da človeštvo zaradi mobilnosti pušča prevelik ogljični odtis.

Ker sva oba raziskovalca precej tehnično usmerjena, sva dobila idejo, da bi prenovila starodobno kolo. Po pregledu obstoječe literature sva oblikovala naslov raziskovalne naloge: Retro se vrača.

Namen najine naloge je raziskati, kakšen je postopek obnove starinskega kolesa. Zanimalo naju je tudi, kako se starodobno kolo obnese v primerjavi z novejšimi kolesi. Zanimalo naju je tudi, v koliko je najino kolo originalno in koliko je obnovljeno kolo tudi dejansko vredno.

Pri delu sva uporabila več metod dela, in sicer analizo pisnih virov, delo v delavnici, primerjavo kolesa z ostalimi kolesi na kolesarskem poligonu ter obisk Avto moto kluba Classic. V AMK Classic sva ugotovila, da je najino kolo nekaj posebnega, saj je bilo dobro ohanjeno z vsemi originalnimi nadomestnimi deli. Za raziskovalni del naloge sva se pogovorila z najinimi starimi starši. Zanimalo naju je, kako je bilo s kolesarjenjem nekoč. Na koncu sva se preskusila tudi kot učitelja, in sicer sva predstavila kolo učencem 5. razreda, ki v letošnjem šolskem letu opravljajo kolesarski izpit. Poudarila sva pomen kolesarjenja in varnosti na kolesu.

Z raziskovalno nalogo sva ugotovila, da vse, kar je starega, pač še ni za odpad. Z veseljem bova uporabljala kolo na dogodkih v šoli ali v najinem mestu Slovenska Bistrica ter z njim ozaveščala ljudi o trajnostni mobilnosti. Veseli naju tudi, da sva s kolesom ohranila del naše kulturne dediščine.

Summary:

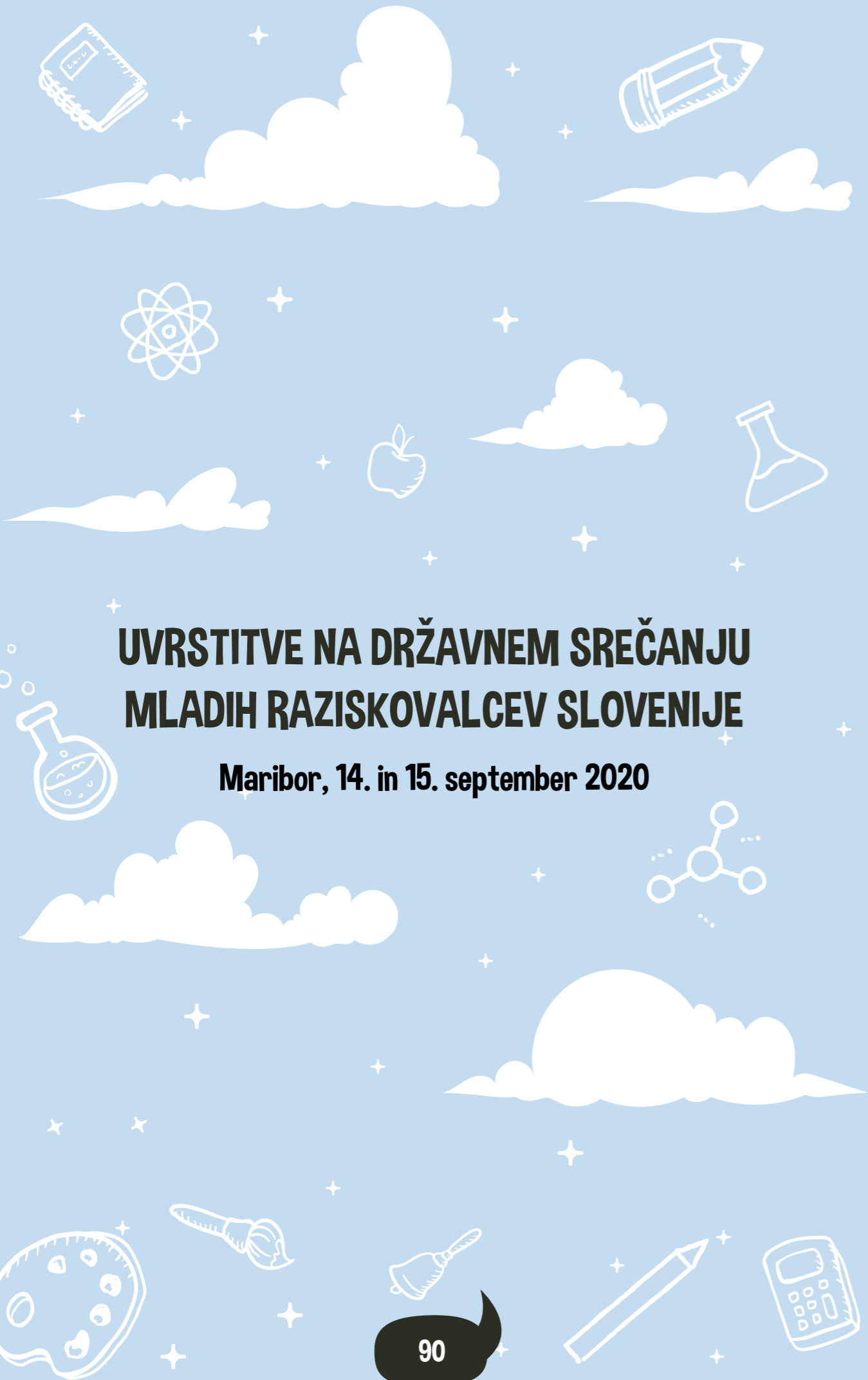
Bicycle is definitely one of the fastest, one of the most popular and one of the most efficient means of transportation in the world. Learning how to ride a bicycle is an important milestone for children. Children learn how to pedal at quite an early age, but formally and independently the bicycle can be used when one successfully passes the cycling exam.

Riding a bicycle means independence from our parents and we are also aware of the carbon footprint mobility leaves on our planet. Both of us are pretty technically oriented and we thought it would be interesting to restore an old bicycle. After looking through the existing literature we decided the title of our research project should be Retro Is Back.

Our main aim was to examine the process of restoring an old bicycle. We also wished to compare the old bicycle to the newer ones, how the old bicycle performs, how original our bike is and how much money the restored bicycle is actually worth. In our research project we used several different methods of work – analysis of written sources, practical work in the workshop, comparison of our bicycle to other bicycles on a cycling track and visiting the Auto Moto Club Classic. Our visit to the Auto Moto Club Classic showed that our bicycle was something special. It was very well preserved with all original spare parts. In the empirical part of our research project we talked to our grandparents. We discussed how cycling was like in the past. In the end we tried ourselves as teachers and introduced our bicycle to the 5th grade students, who are preparing for the cycling exam. We introduced cycling and talked about the importance of cycling safety.

Our research project shows that not everything old should be thrown away. We will be proud to use our bicycle at different school events or events around our town and help raise people's awareness of sustainable mobility. We are also pleased to have preserved one part of our cultural heritage with our bicycle restoration.

OSNOVNE ŠOLE



UVRSTITVE NA DRŽAVNEM SREČANJU MLADIH RAZISKOVALCEV SLOVENIJE

Maribor, 14. in 15. september 2020

RAZISKOVALNO PODROČJE	ŠOLA	NASLOV RN	PRIZNANJE
Arhitektura, gradbeništvo ali promet	OŠ Gustava Šiliha Laporje	Iz pritličja v mansardo	ZLATO
Tehnika ali tehnologija	OŠ Anice Černejeve Makole	Začetne fotografske tehnike z »LEGO« kamero lastne izdelave	ZLATO
Interdisciplinarna področja	OŠ Cirkovce	Kupiti ali oprati?	ZLATO
Druga področja	JVIZ Destrnik-Trnovska vas	Kaj imajo skupnega šport, matematika in logika?	ZLATO
Arhitektura, gradbeništvo ali promet	OŠ Ormož	Sloveniaring Ormož	SREBRNO
Geografija ali geologija	OŠ Antona Ingoliča Spodnja Polskava	Gnetenje pragerskih priložnosti	SREBRNO
Slovenski jezik ali književnost	OŠ Ormož	KMS?	SREBRNO
Kemija ali kemijska tehnologija	OŠ Ljudski vrt Ptuj, podružnica Grajena	Težke kovine v zelenjavi	SREBRNO
Druga področja	OŠ Žetale	Vpliv telesne aktivnosti na srčni utrip in telesno težo	SREBRNO
Biologija	OŠ Ormož	Tišje, prosim	BRONASTO
Astronomija ali fizika	OŠ Ljudski vrt Ptuj	Jedrsko fuzija	BRONASTO
Etnologija	OŠ Mladika	Fašenk v Spuhlji	BRONASTO
Psihologija ali pedagogika	OŠ Gustava Šiliha Laporje	»Že videno«	BRONASTO
Ekonomija ali turizem	OŠ Gustava Šiliha Laporje	Ekološko ali neekološko	BRONASTO
Slovenski jezik ali književnost	OŠ Gustava Šiliha Laporje	Individualne značilnosti pisave učencev OŠ Gustava Šiliha Laporje	BRONASTO
Zgodovina ali umetnostna zgodovina	OŠ Anice Černejeve Makole	Nova odkritja v zbirki mojstra fotografske umetnosti Dragiše Modrinjaka	BRONASTO
Tehnika ali tehnologija	2. OŠ Slovenska Bistrica	Retro se vrača	BRONASTO
Ekologija z varstvom okolja	OŠ Kidričevo	Cvetje v kulinariki	BRONASTO
Matematika ali logika	JVIZ Destrnik-Trnovska vas	Pitagorov izrek in podobnost	BRONASTO
Filozofija ali sociologija	OŠ Gustava Šiliha Laporje	Novodobni mediji - nadloga ali prednost?	BRONASTO
Interdisciplinarna področja	2. OŠ Slovenska Bistrica	Šola in prosti čas z roko v roki	BRONASTO
Aplikativni inovacijski predlogi in projekti	OŠ Olge Meglič	Eksperimentalni rimski kamp Poetovio	BRONASTO
Aplikativni inovacijski predlogi in projekti	OŠ Ormož	Kavalek	BRONASTO
Računalništvo ali telekomunikacije	2. OŠ Slovenska Bistrica	Aplikacija KEŠ	BRONASTO

SREDNJE ŠOLE

RAZISKOVALNO PODROČJE	ŠOLA	NASLOV RN	PRIZNANJE
Računalništvo ali telekomunikacije	ŠC Ptuj, ERŠ	Reševanje igre Sudoku z umetno inteligenco	ZLATO
Kemija ali kemijska tehnologija	Gimnazija Ptuj	Upravljanje aktivnosti encimov v moki	SREBRNO
Ekologija z varstvom okolja	ŠC Ptuj, Biotehniška šola	Zimsko štetje Mokožev <i>Rallus aquaticus</i> v naravnem rezervatu Ormoške lagune	BRONASTO
Elektrotehnika, elektronika in robotika	ŠC Ptuj, ERŠ	Avtonomno vozilo	BRONASTO
Elektrotehnika, elektronika in robotika	ŠC Ptuj, ERŠ	Avtonomni robot z Arduino sistemom	BRONASTO
Elektrotehnika, elektronika in robotika	ŠC Ptuj, ERŠ	Izdelava robotske roke	BRONASTO
Interdisciplinarna področja	ŠC Ptuj, ERŠ	Izdelava merilnega vmesnika z Arduino mikroprocesorskim sistemom	BRONASTO

ABECEDNI SEZNAM OSNOVNIH ŠOL

OSNOVNE ŠOLE

2. OŠ Slovenska Bistrica

OŠ Anice Černejeve Makole

OŠ Antona Ingoliča Spodnja Polskava, podružnica Pragersko

OŠ Cirkovce

OŠ Destrnik - Trnovska vas

OŠ Gustava Šiliha Laporje

OŠ Hajdina

OŠ Kidričevo

OŠ Ljudski vrt Ptuj

OŠ Ljudski vrt Ptuj, podružnica Grajena

OŠ Majšperk

OŠ Markovci

OŠ Mladika Ptuj

OŠ Olge Meglič Ptuj

OŠ Ormož

OŠ Podlehnik

OŠ Središče ob Dravi

OŠ Žetale

ABECEDNI SEZNAM MLADIH RAZISKOVALCEV OSNOVNIH ŠOL

MLADI RAZISKOVALCI

Ajda Hajnal
Alina Auer
Alja Šela
Aljaž Habjanec
Ana Marie Babšek Vrečko
Ana Marija Gajšek
Ana Potočnik
Ana Štibler
Ana Žnidarič
Anže Pregl
Anže Šibila
Anže Žnidarko
Blažka Margušič
Boris Lozinšek
Brina Rahle
Charlie Križanc Stojnšek
Daša Horvat
Daša Polanec
Dina Grabovac
Ela Holc
Ema Doberšek
Ema Mesarič
Ema Šoštarič
Ema Vantur
Eva Kozoderc
Eva Zala Kitek
Filip Fras
Gaja Ganzitti
Hana Hren
Hana Kocet

Iva Grobelšek
Iva Plavec
Jaka Glažar
Jana Železnik
Jana Žnidarič
Jernej Kosajnc
Jure Glažar
Jure Jesenek
Jure Rudolf
Kaja Kralj
Kaljun Oskar
Karla Rap
Katarina Šela
Klara Loboda
Klara Sužnik
Lana Krošel
Lana Zadavec
Lara Kolar
Lara Tekmec
Larisa Maček
Lea Strelec
Lina Šnajder
Luka Šlamberger
Maj Bezjak
Maja Bokša
Maja Kristovič
Maja Majcen
Maruša Pučnik
Maša Fras
Maša Žnidarič
Neja Gajzer

ABECEDNI SEZNAM MENTORJEV OSNOVNIH ŠOL

Nejc Črepnjak
Neli Gošnjak
Neža Štandeker
Nina Horvat
Noa Tušek
Noel Arnuš
Nuša Malek
Pia Klasinc
Pia Zemljarič
Rok Vajngerl
Rozalija Lia Muršec
Sandro Čeh
Sanja Bevc
Sara Bele
Sara Merc
Saša Janžekovič
Špela Hajnal
Teja Črnko Širec
Tibor Novak
Tim Perkovič
Tjaš Notersberg
Tjaša Petrovič
Vid Petrovič
Vita Toplak
Zala Roškar
Zana Kovačič
Žana Dorič
Živa Gabrovec

Adriana Petrovič
mag. Aleksandra Čeh
mag. Alenka Fidler
Alenka Šalamon
Aljaž Selinšek
Ana Pejkovič
Andrej Klasinc
dr. Andrej Šafhalter
Andreja Špacapan
Anita Malovič
Benjamin Lipnik
Bojana Marin
Brigita Brajkovič
Drago Prelog
Edita Čelofiga
Grega Belšak
Igor Keber
Ines Jarh
dr. Irena Kandrič
Ivanka Čeh
Jana Jerenec
Janja Rudolf
Jasna Cafuta
Jelica Ilić
Katja Leva
Klavdija Murko
Luka Husu
Maja Smiljan
Majda Kramberger Belšak
Marija Meklav
Marjetka Čas
Marjetka Vidovič
Marta Glatz

Mateja Zupanec
Mihaela Cajnko Gojkošek
Mojca Bauman Kralj
Nataša Kolar
dr. Nataša Rizman Herga
Nataša Vauda
dr. Renata Debeljak
Renata Jesenek
Robert Mlakar
Saša Kranjc Bek
Sonja Lenarčič
Stanka Drobnak
Špela Horvat
Tina Lešnik
Tina Zdravec
Urška Jaroš
Veronika Frešer
Vesna Potočnik

ABECEDNI SEZNAM SREDNJIH ŠOL

SREDNJE ŠOLE

Gimnazija ptuj
ŠC Ptuj, Biotehniška šola
ŠC Ptuj, Elektro in računalniška šola

ABECEDNI SEZNAM RAZISKOVALCEV SREDNJIH ŠOL

MLADI RAZISKOVALCI

Alen Cvetko
Alja Rozman
Lara Petek
Leon Panič
Mateja Golc
Simon Plazar
Tomi Polanec
Viktorija Unuk
Žiga Belšak

ABECEDNI SEZNAM MENTORJEV SREDNJIH ŠOL

MENTORJI

dr. Bojan Ploj

dr. Boris Zmazek

mag. Dominik Bombek

Franc Vrbančič

mag. Gabrijela Plateis

dr. Gordana Hojnik Podrepšek

dr. Maja Leitgeb

Miran Lazar

Tilen Basle

ABECEDNI SEZNAM REČENZENTOV

REČENZENTI

dr. Anamarija L. Mrgole

Anja Potočnik

Bojana Murko

Boštjan Koletnik

Damjana Lah

Daniel Tement

Darja Plajnšek

dr. Dragica Pešaković

dr. Dušan Klinar

Ines Bezjak

Julija Potisk

Katja Vrabl

Klavdija Srša

dr. Martin Trbuc

mag. Mirjana Nenad

Mitja Lah

mag. Mojca Metličar

Mojca Slana

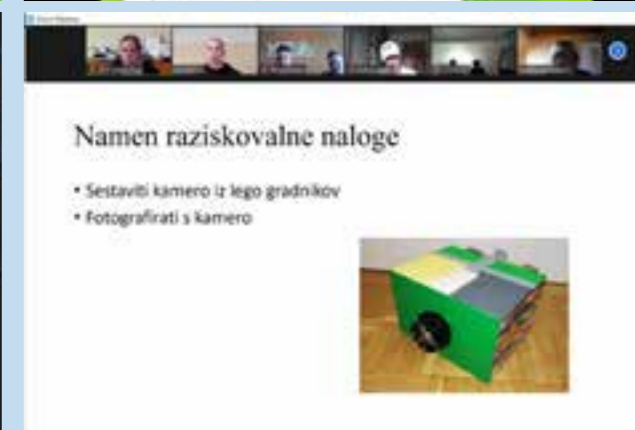
Neža Tement

Robert Novak

dr. Štefan Čelan

IZVEDBO PROJEKTA SO OMOGOČILI:

Mestna občina Ptuj
 Občina Destrnik
 Občina Dornava
 Občina Gorišnica
 Občina Hajdina
 Občina Juršinci
 Občina Kidričevo
 Občina Majšperk
 Občina Makole
 Občina Markovci
 Občina Ormož
 Občina Podlehnik
 Občina Slovenska Bistrica
 Občina Središče ob Dravi
 Občina Trnovska vas
 Občina Videm
 Občina Zavrč
 Občina Žetale



KMS?

Lana Zdravec, Ana Žnidarič, Jana Žnidarič, 8. razred

Medicina: Tma Zdravstva in Biotika (Biogenika)

Ormož, maj 2020

Zoom meeting grid showing participants: Rozalja Lix Mur..., Živa Gabrovec, and others.

Zoom meeting grid showing a participant in a room with bookshelves.

Namen raziskovanja je bil izvedeti:

- Kako roboti pri operacijah, zdravstvu pri operacijah ter na splošno v medicini koristijo človeku.
- Raziskovno vprašanje: Kakšno vlogo imajo roboti pri razvoju medicine in kako koristijo človeku?
- Hipoteze:
 - Z uvajanjem robotov v medicino so čakalne vrste krajše.
 - Roboti omogočajo hitrejši razvoj medicine.

Zaključek

BOJIMO DEL REŠEVANJA, NE DEL OMSNAŽEVANJA.

Zoom meeting grid showing a participant in a room with a bookshelf.

Ogled medicinske fakultete

Zoom meeting grid showing two participants in a room.

HVALA ZA VAŠ POZORNOST!

NAMENI IN CILJI RAZISKAVE

Positivna motivacija

- Grajenje odnosa,
- razgrajevanje pravih vedenj

Zoom meeting grid showing a participant in a room with a green chalkboard.

HIPOTEZE:

HIPOTEZA 1 ✓ HIPOTEZA 2 ✓
 HIPOTEZA 3 ✓ HIPOTEZA 4 ✓
 HIPOTEZA 5 ✗ HIPOTEZA 6 ✗

NAMEN in POTEK

- raziskati kakšen vpliv ima Luna na človeka,
- kako masetrace/objektive dokazati vpliv Lune v raziskovalni razlogi,
- statistični podatki PU Maribor – preveriti avtoriteto,
- povprečno število mesečev na dan v mesecu,
- postopoma v preveriti li, zaradi na dan polni luna.

HIPOTEZE

- Učencem naše šole od 6.-9. r. je všeč glasbila harmonika.
- Vloga diatonizirne harmonike v instrumentalni glasbi zavzema pomembno mesto.

OBLIKE IN METODE DELA

- deskriptivna metoda
- deduktivna metoda
- intervju in metoda anketiranja

Zoom meeting grid showing a participant in a room.



4. STRAN APLIKACIJE (DAMO OB PRVEM OBSEGU APLIKACIJE)

Ustvarjena je profilna stran, ki omogoča vpisovanje in izpisovanje uporabnikov. Vse uporabnike, ki jih želimo vključiti, moramo najprej ustvariti. Za ustvarjanje profila uporabnik vnese svoje podatke, ime in priimek, nato pa potrdi nastavitve.

ZIMSKO ŠTETJE MOKOŽEV RAIŠU OPAVITIC V NARAVNEM REZERVATU ORMOŠKE LAGUNE

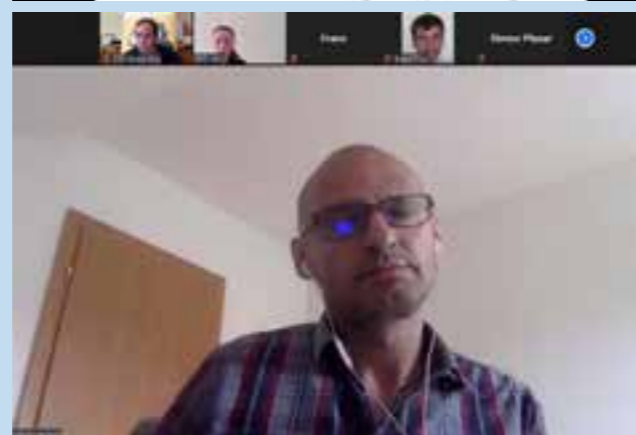
Naravni rezervat Ormoške lagune je ena od največjih in najlepših lagun v Sloveniji. V naravnem rezervatu Ormoške lagune raste veliko vrst mokožev, ki so pomembne za okolje in turizem. V naravnem rezervatu Ormoške lagune raste veliko vrst mokožev, ki so pomembne za okolje in turizem.



REZULTATI RAZISKOVALNE NALOGE

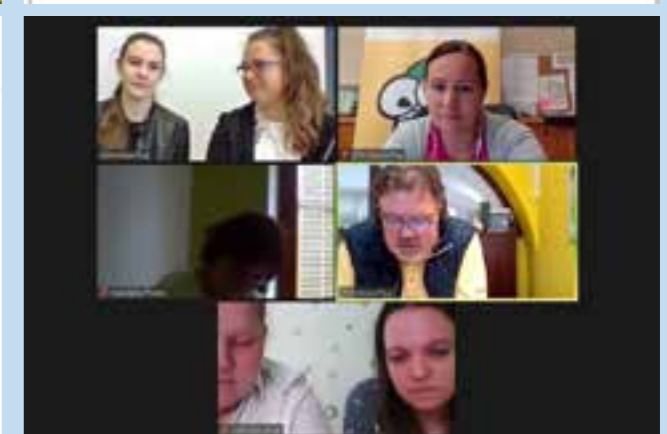
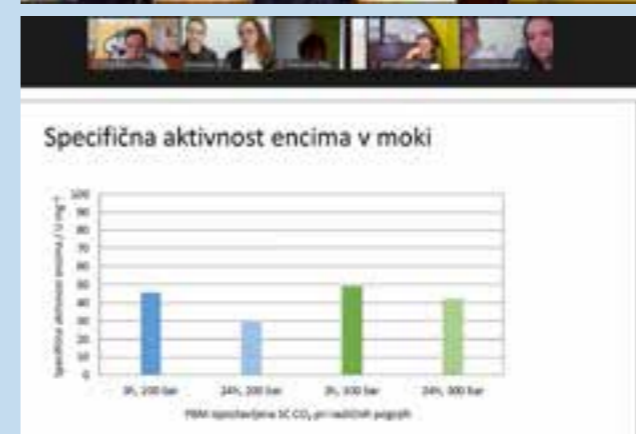
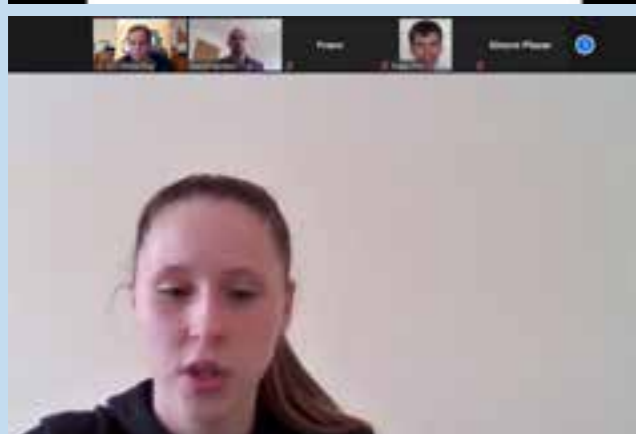
Raziskovalna vprašanja:
 - Ali obstaja oz. natančneje povedati: ali obstaja povezava med porabo in zdravjem?
 - Ali velja tudi za otroke in mlade ljudi?

Rezultati:
 - Velika večina mladih ljudi je zdrava.
 - Čeprav obstaja povezava med porabo in zdravjem, ni jasno, ali je to posledica uporabe aplikacije ali neke druge stvari.



Namen naloge

- Zmanjšati aktivnost encima polifenol oksidaze.
- Podaljšati moki rok uporabnosti.
- Raziskati vpliv SC CO₂ na delež vitamina C v moki.



Raziskovalna vprašanja

- Kaj so aditivi, zakaj se uporabljajo in kje jih najdemo?
- Ali so potrebni dovolj ozaveščeni o aditivih, njihovih lastnostih in morebitnih učinkih na zdravje?
- Ali so aditivi škodljivi, in če ja, ali so škodljivi vsi?

Uvod in cilj

Naravni rezervat Ormoške lagune je ena od največjih in najlepših lagun v Sloveniji. V naravnem rezervatu Ormoške lagune raste veliko vrst mokožev, ki so pomembne za okolje in turizem. V naravnem rezervatu Ormoške lagune raste veliko vrst mokožev, ki so pomembne za okolje in turizem.



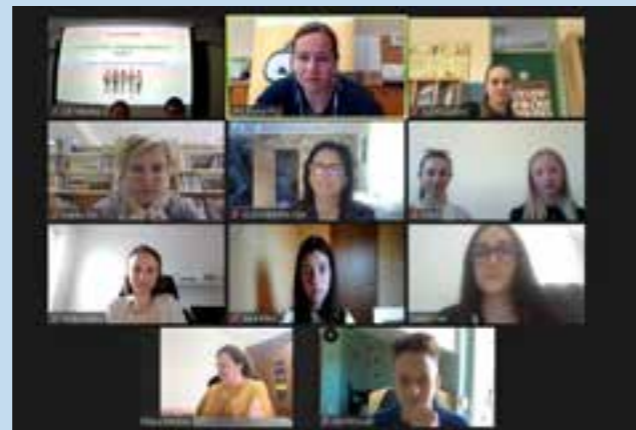
HIPOTEZA 1

Učenci težko usklajujejo šolske obveznosti in prostorašne dejavnosti.

- Hipoteza dva ovrgli.

SKLEP

- Uspešno?
- Raziskovalna naloga kot pomoč učencem in staršem – letak



Ali igra mladi z obilnim vpisom na šole?

Načrt raziskave

- razgovor z mentorjem
- študija teorije
- načrtovanje algoritma
- učbenik in naloga strojne opreme
- testiranje strojne opreme in postava
- izdelava algoritma v IDE
- testiranje rešitve

ČEBELARJENJE V LOKALNI SKUPNOSTI

Interdisciplinarna vadilnica: Matematika, Znanost

Maribor, 2020

RAZISKOVALNI DEL

TERENSKO DELO

Ogled družinskega čebelnjaka ŽDM in analiza komunikacije v pridelovalni T. Petruši

Ogled čebelnjakov v shteti Maribor in Videm ter analiza komunikacije z lokalnimi čebelarji

ESTAVA IN DELOVANJE ROBOVSKE ROKE



oŠ kibičvrvo

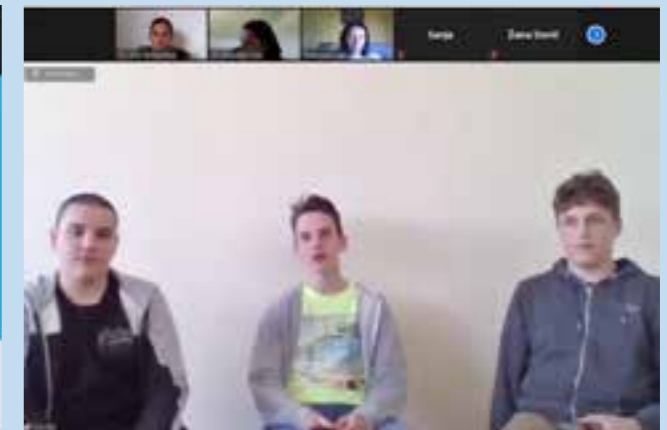
JE ALI NI? – TO JE ZDAJ VPRAŠANJE

RAZISKOVALNA NALOGA
FIZIKA IN SOCIOLOGIJA

Avtorja: Tabor Novak, Anže Šibila

Mentorica: Jona Jerenc

Pluj, maj 2020



KUPITI ALI OPRATI

PSIHOLOGIJA, EKOLOGIJA, KEMIJA



RAZLIKE MED KLAVIRSKO, DIATONIČNO IN KROMATIČNO HARMONIKO

