

Kreativnost i inovativnost u nastavi

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Kreativnost vs. inovativnost

- **Kreativnost** je proces iznalaženja **originalnih ideja** koje imaju **vrijednost**.
 - Važno je imati na umu još dva koncepta: **maštu** i **inovativnost**.
- Ken Robinson
- **Mašta** je izvor kreativnosti...
 - **Kreativnost** je proces iznalaženja **originalnih ideja** koje imaju **vrijednost**.
 - **Inovativnost** je primjena novih ideja...

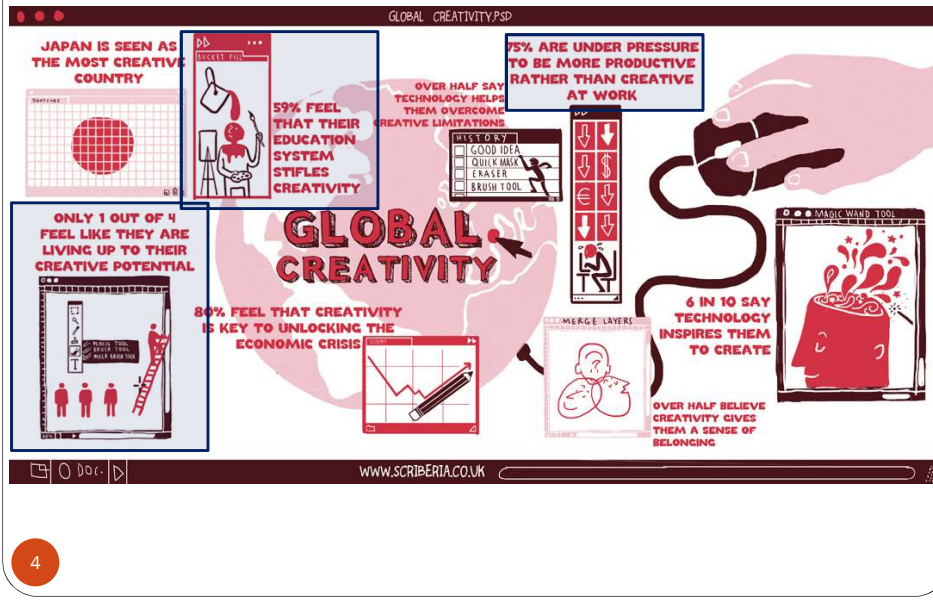


Jeste li znali?...svijet?

- U izvješću IBM-a iz 2010. godine, preko 700 menadžera koji se bave ljudskim potencijalima prepoznaje **kreativnost kao ključno oružje u suočavanju s rastućom kompleksnosti** kao posljedicom razvoja suvremenog društva.
- ...
- IBM izvješće > 1800 CEO > 80 država.....najvažnija stvar koja muči menadžere jest (2) **prilagodljivost**, a najvažniji prioritet je **kreativnost (1)**
- ...
- Adobe je 2012. godine proveo istraživanje koje otkriva **globalni kreativni jaz u 5 najvećih svjetskih ekonomija**.
- Istraživanje koje je provedeno na **5.000 odraslih osoba u SAD-u, UK-u, Njemačkoj, Francuskoj i Japanu** otkriva **raskorak kreativnosti na radnome mjestu**.
- ...

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Jeste li znali?...svijet?



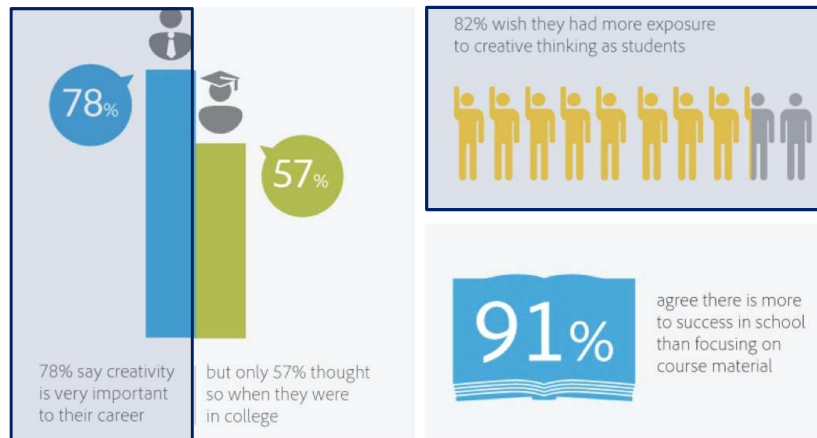
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- Istraživanje koje je provedeno na 5.000 odraslih osoba u SAD-u, UK-u, Njemačkoj, Francuskoj i Japanu otkriva raskorak kreativnosti na radnome mjestu
- U svim zemljama ispitanici su izjavili da provode samo 25% svoga vremena na poslu stvarajući, a kao najveću prepreku kreativnosti navode nedostatak vremena (47 %).
- ...
- U Adobe-ovu istraživanju obrazovanje se spominje kao najveći „ubojica“ kreativnosti. Naime, većina ispitanika osjeća kako njihovu kreativnost guše obrazovni sustavi.
- Tako misli većina ispitanika u svim državama te čak 70 % u SAD-u.

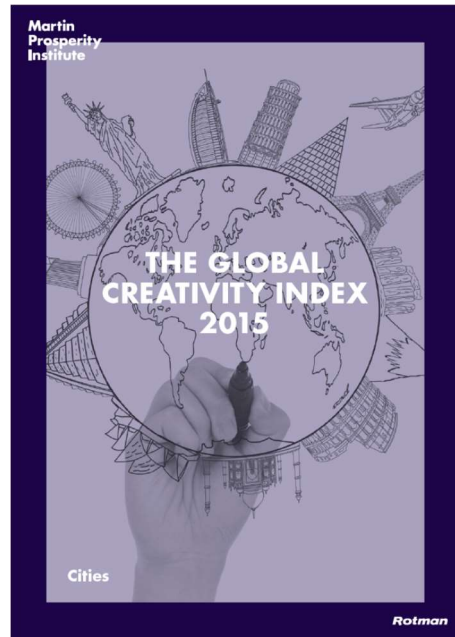
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Jeste li znali?... svijet?



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Jeste li znali?... RH i svijet?

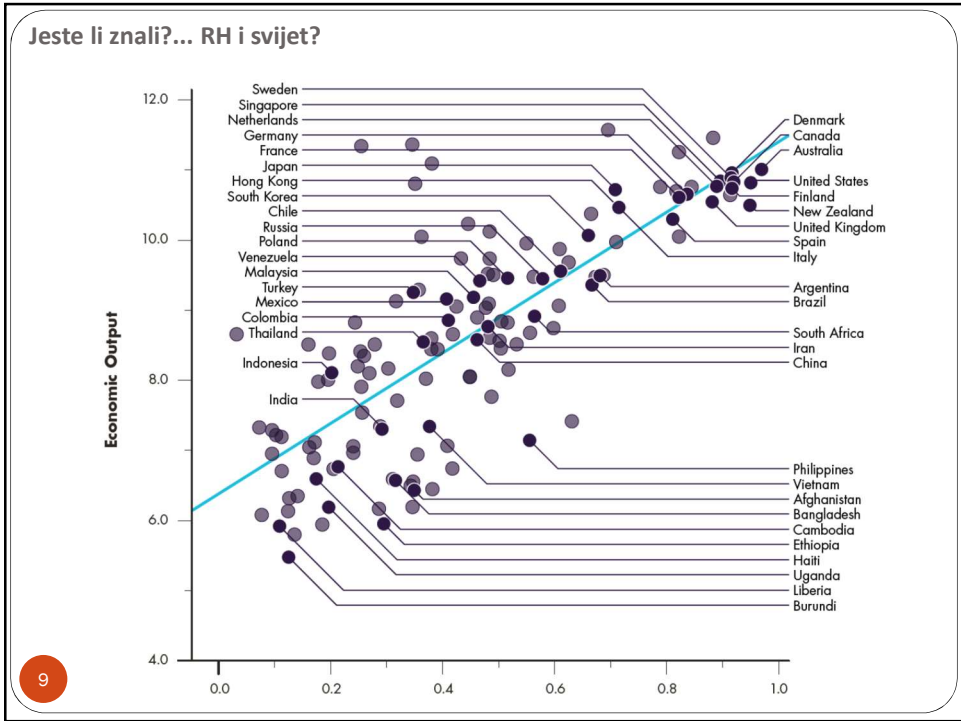


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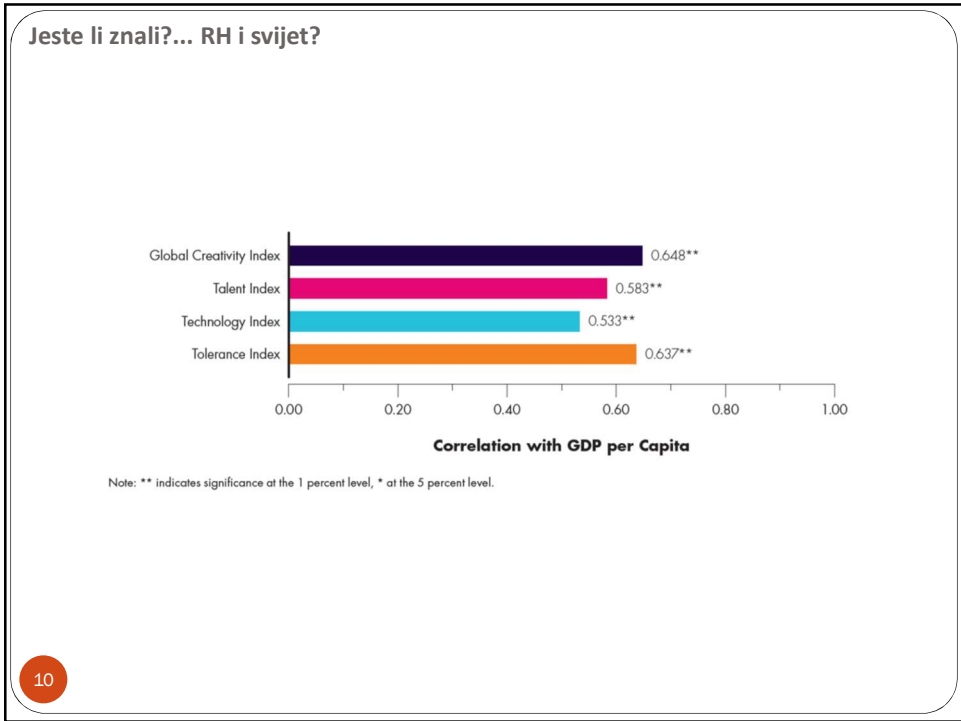
Jeste li znali?... RH i svijet?

THE GLOBAL CREATIVITY INDEX					
Rank	Country	Technology	Talent	Tolerance	Global Creativity Index
51	Lithuania	65	12	105	0.490
52	Philippines	54	65	53	0.487
54	Slovak Republic	69	42	66	0.484
54	Serbia	70	45	58	0.484
54	Greece	39	43	101	0.484
56	Panama	70	67	34	0.482
57	Iran	—	71	72	0.481
58	Croatia	60	39	81	0.481
59	Mauritius	—	76	68	0.477
60	Venezuela	40	83	61	0.466

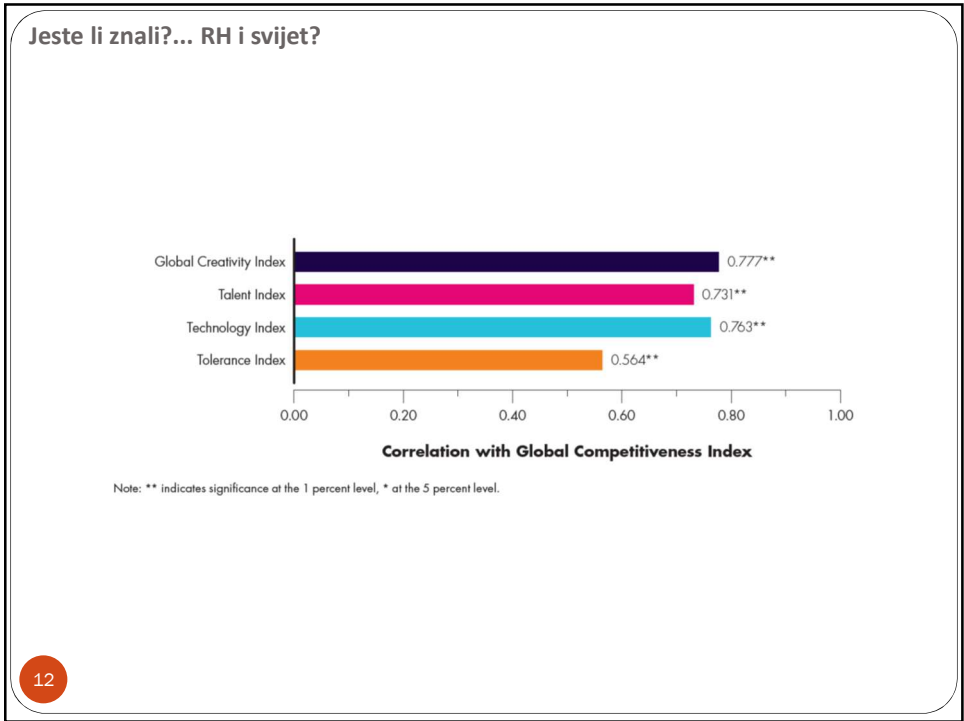
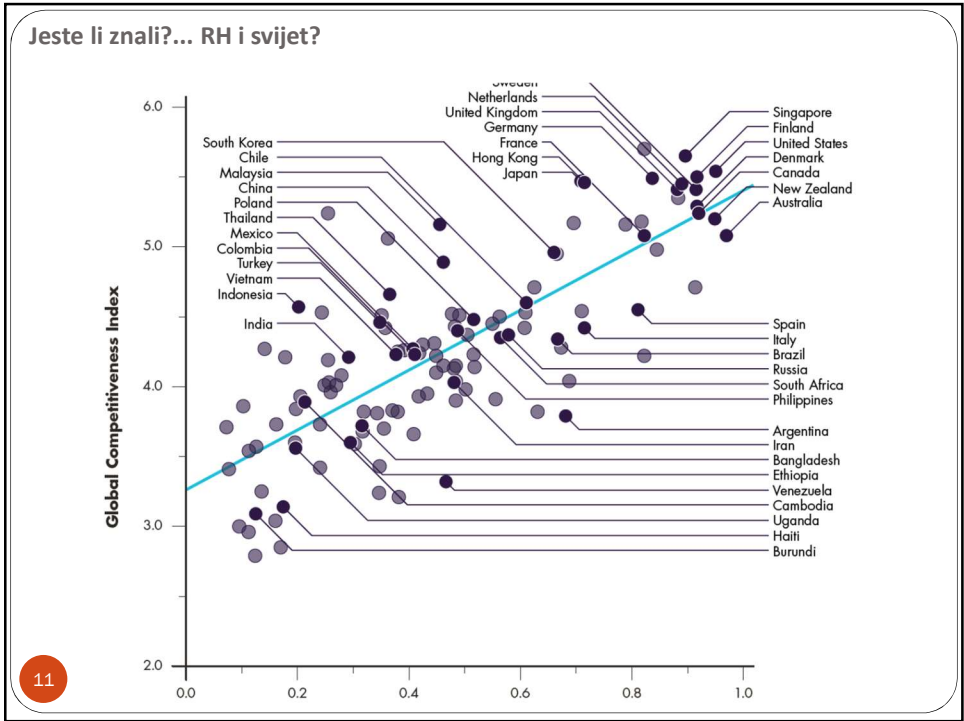
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Jeste li znali?... RH i svijet?



Insight Report

The Global Competitiveness Report 2018

Klaus Schwab, World Economic Forum



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Jeste li znali?... RH i svijet?

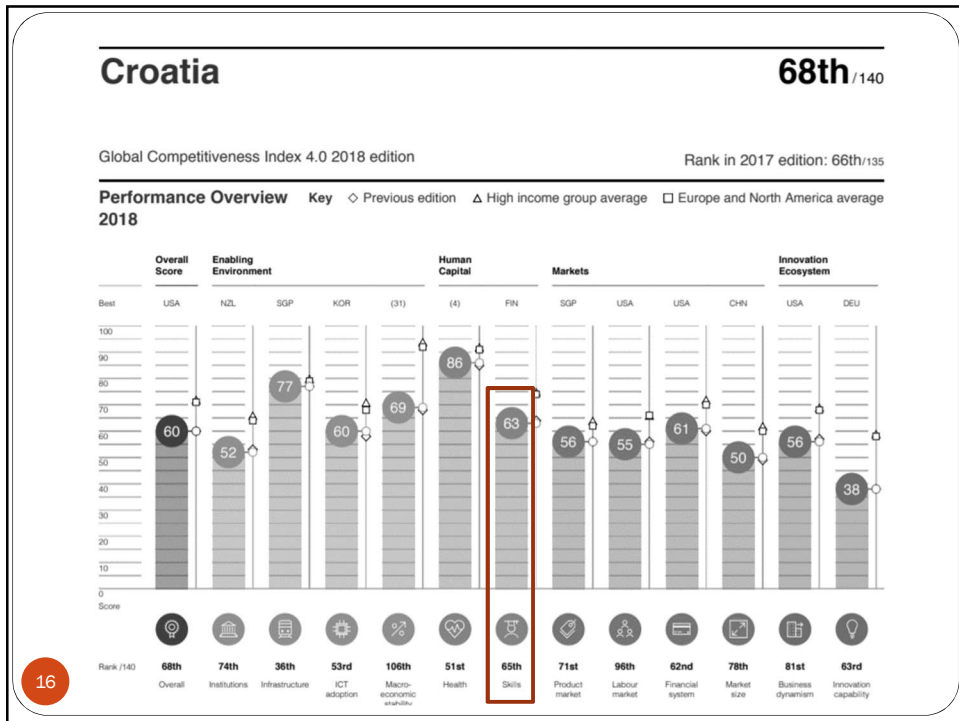
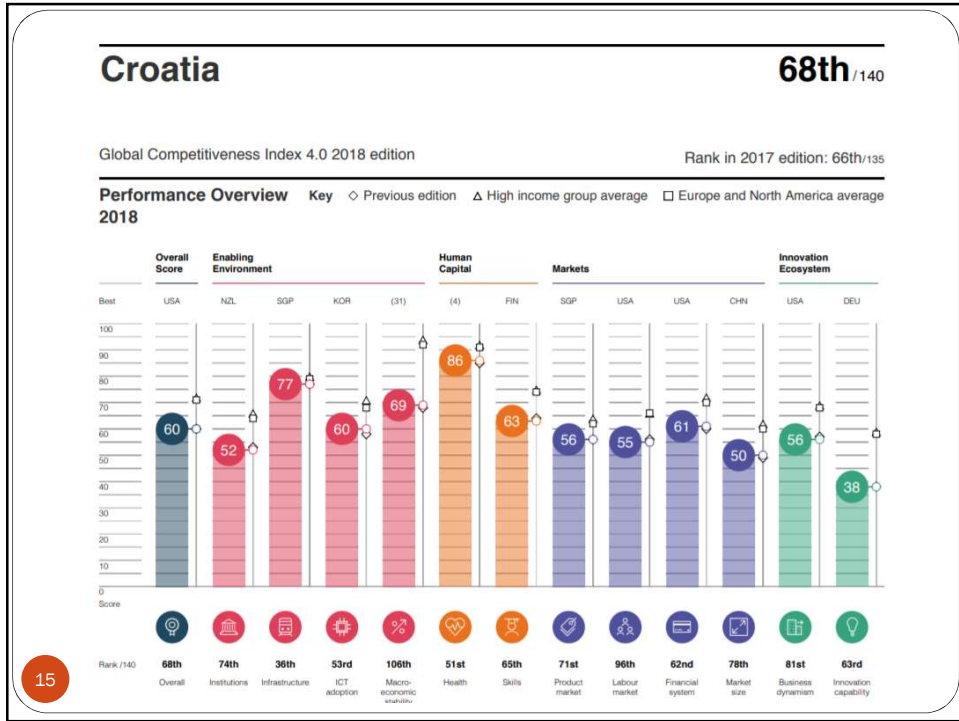
The Global Competitiveness Index 4.0 2018 Rankings

Covering 140 economies, the Global Competitiveness Index 4.0 measures national competitiveness—defined as the set of institutions, policies and factors that determine the level of productivity.

2018 (vs 2017)			2018 (vs 2017)			2018 (vs 2017)		
Rank	Economy	Score*	Rank	Economy	Score*	Rank	Economy	Score*
1	United States	85.6	1	United States	85.6	1	United States	85.6
2	Singapore	83.5	2	Singapore	83.5	2	Singapore	83.5
3	Germany	82.8	3	Germany	82.8	3	Germany	82.8
4	Switzerland	82.6	4	Switzerland	82.6	4	Switzerland	82.6
5	Japan	82.5	5	Japan	82.5	5	Japan	82.5
6	Netherlands	82.4	6	Netherlands	82.4	6	Netherlands	82.4
7	Hong Kong SAR	82.3	7	Hong Kong SAR	82.3	7	Hong Kong SAR	82.3
8	United Kingdom	82.0	8	United Kingdom	82.0	8	United Kingdom	82.0
9	Sweden	81.7	9	Sweden	81.7	9	Sweden	81.7
10	Denmark	80.6	10	Denmark	80.6	10	Denmark	80.6
11	Finland	80.3	11	Finland	80.3	11	Finland	80.3
12	Canada	79.9	12	Canada	79.9	12	Canada	79.9
13	Taiwan, China	79.3	13	Taiwan, China	79.3	13	Taiwan, China	79.3
14	Australia	78.9	14	Australia	78.9	14	Australia	78.9
15	South Korea	78.8	15	South Korea	78.8	15	South Korea	78.8
16	Norway	78.2	16	Norway	78.2	16	Norway	78.2
17	France	78.0	17	France	78.0	17	France	78.0
18	New Zealand	77.8	18	New Zealand	77.8	18	New Zealand	77.8
19	Luxembourg	76.6	19	Luxembourg	76.6	19	Luxembourg	76.6
20	Ireland	76.6	20	Ireland	76.6	20	Ireland	76.6
21	Belgium	76.6	21	Belgium	76.6	21	Belgium	76.6
22	Austria	76.5	22	Austria	76.5	22	Austria	76.5
23	Iceland	75.7	23	Iceland	75.7	23	Iceland	75.7
24	Israel	74.5	24	Israel	74.5	24	Israel	74.5
25	Malaysia	74.4	25	Malaysia	74.4	25	Malaysia	74.4
26	Spain	74.2	26	Spain	74.2	26	Spain	74.2
27	United Arab Emirates	73.4	27	United Arab Emirates	73.4	27	United Arab Emirates	73.4
28	China	72.6	28	China	72.6	28	China	72.6
29	Costa Rica	71.2	29	Costa Rica	71.2	29	Costa Rica	71.2
30	Qatar	71.0	30	Qatar	71.0	30	Qatar	71.0
31	Italy	70.8	31	Italy	70.8	31	Italy	70.8
32	Estonia	70.8	32	Estonia	70.8	32	Estonia	70.8
33	Chile	70.2	33	Chile	70.2	33	Chile	70.2
34	Portugal	70.2	34	Portugal	70.2	34	Portugal	70.2
35	Slovenia	69.6	35	Slovenia	69.6	35	Slovenia	69.6
36	Malta	68.8	36	Malta	68.8	36	Malta	68.8
37	Poland	68.2	37	Poland	68.2	37	Poland	68.2
38	Thailand	67.8	38	Thailand	67.8	38	Thailand	67.8
39	Saudi Arabia	67.5	39	Saudi Arabia	67.5	39	Saudi Arabia	67.5
40	Lithuania	67.1	40	Lithuania	67.1	40	Lithuania	67.1
41	Slovak Republic	66.8	41	Slovak Republic	66.8	41	Slovak Republic	66.8
42	Lebanon	66.2	42	Lebanon	66.2	42	Lebanon	66.2
43	Russian Federation	65.6	43	Russian Federation	65.6	43	Russian Federation	65.6
44	Cyprus	65.6	44	Cyprus	65.6	44	Cyprus	65.6
45	Indonesia	64.9	45	Indonesia	64.9	45	Indonesia	64.9
46	Mexico	64.6	46	Mexico	64.6	46	Mexico	64.6
47	Ukraine	64.4	47	Ukraine	64.4	47	Ukraine	64.4
48	Hungary	64.3	48	Hungary	64.3	48	Hungary	64.3
49	Norway	63.7	49	Norway	63.7	49	Norway	63.7
50	Maldives	63.5	50	Maldives	63.5	50	Maldives	63.5
51	Costa Rica	63.4	51	Costa Rica	63.4	51	Costa Rica	63.4
52	Colombia	63.4	52	Colombia	63.4	52	Colombia	63.4
53	Peru	63.3	53	Peru	63.3	53	Peru	63.3
54	Chile	63.2	54	Chile	63.2	54	Chile	63.2
55	Paraguay	63.1	55	Paraguay	63.1	55	Paraguay	63.1
56	Uruguay	62.7	56	Uruguay	62.7	56	Uruguay	62.7
57	South Africa	62.1	57	South Africa	62.1	57	South Africa	62.1
58	Philippines	62.1	58	Philippines	62.1	58	Philippines	62.1
59	Vietnam	62.0	59	Vietnam	62.0	59	Vietnam	62.0
60	Guatemala	61.8	60	Guatemala	61.8	60	Guatemala	61.8
61	Uzbekistan	61.8	61	Uzbekistan	61.8	61	Uzbekistan	61.8
62	India	61.6	62	India	61.6	62	India	61.6
63	Ukraine	61.6	63	Ukraine	61.6	63	Ukraine	61.6
64	South Korea	61.6	64	South Korea	61.6	64	South Korea	61.6
65	Spain	61.5	65	Spain	61.5	65	Spain	61.5
66	Germany	61.5	66	Germany	61.5	66	Germany	61.5
67	France	61.3	67	France	61.3	67	France	61.3
68	Denmark	61.3	68	Denmark	61.3	68	Denmark	61.3
69	Poland	61.2	69	Poland	61.2	69	Poland	61.2
70	Switzerland	61.2	70	Switzerland	61.2	70	Switzerland	61.2
71	Canada	61.2	71	Canada	61.2	71	Canada	61.2
72	China	61.2	72	China	61.2	72	China	61.2
73	Finland	61.2	73	Finland	61.2	73	Finland	61.2
74	Japan	61.2	74	Japan	61.2	74	Japan	61.2
75	Ukraine	61.2	75	Ukraine	61.2	75	Ukraine	61.2
76	Ukraine	61.2	76	Ukraine	61.2	76	Ukraine	61.2
77	Ukraine	61.2	77	Ukraine	61.2	77	Ukraine	61.2
78	Ukraine	61.2	78	Ukraine	61.2	78	Ukraine	61.2
79	Ukraine	61.2	79	Ukraine	61.2	79	Ukraine	61.2
80	Ukraine	61.2	80	Ukraine	61.2	80	Ukraine	61.2
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82	Ukraine	61.2	82	Ukraine	61.2	82	Ukraine	61.2
83	Ukraine	61.2	83	Ukraine	61.2	83	Ukraine	61.2
84	Ukraine	61.2	84	Ukraine	61.2	84	Ukraine	61.2
85	Ukraine	61.2	85	Ukraine	61.2	85	Ukraine	61.2
86	Ukraine	61.2	86	Ukraine	61.2	86	Ukraine	61.2
87	Ukraine	61.2	87	Ukraine	61.2	87	Ukraine	61.2
88	Ukraine	61.2	88	Ukraine	61.2	88	Ukraine	61.2
89	Ukraine	61.2	89	Ukraine	61.2	89	Ukraine	61.2
90	Ukraine	61.2	90	Ukraine	61.2	90	Ukraine	61.2
91	Ukraine	61.2	91	Ukraine	61.2	91	Ukraine	61.2
92	Ukraine	61.2	92	Ukraine	61.2	92	Ukraine	61.2
93	Ukraine	61.2	93	Ukraine	61.2	93	Ukraine	61.2
94	Ukraine	61.2	94	Ukraine	61.2	94	Ukraine	61.2
95	Ukraine	61.2	95	Ukraine	61.2	95	Ukraine	61.2
96	Ukraine	61.2	96	Ukraine	61.2	96	Ukraine	61.2
97	Ukraine	61.2	97	Ukraine	61.2	97	Ukraine	61.2
98	Ukraine	61.2	98	Ukraine	61.2	98	Ukraine	61.2
99	Ukraine	61.2	99	Ukraine	61.2	99	Ukraine	61.2
100	Ukraine	61.2	100	Ukraine	61.2	100	Ukraine	61.2

68 Croatia 60.1 -2


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Education of **current** workforceSkills of **current** workforceEducation of **future** workforceSkills of **future** workforce

How do you assess the style of teaching?

[1 = frontal, teacher based, and focused on memorizing; 7 = encourages creative and critical individual thinking]

Index Component	Value	Score *	Rank/140
 Pillar 6: Skills 0-100 (best)	-	63.4 ↓	65
6.01 Mean years of schooling Years	11.2	74.7 =	37
6.02 Extent of staff training 1-7 (best)	3.1	34.7 ↓	131
6.03 Quality of vocational training 1-7 (best)	3.5	41.4 ↓	113
6.04 Skillset of graduates 1-7 (best)	3.5	41.1 ↓	116
6.05 Digital skills among population 1-7 (best)	3.6	43.5 ↑	108
6.06 Ease of finding skilled employees 1-7 (best)	3.3	38.7 ↓	124
6.07 School life expectancy Years	15.0	83.1 ↓	55
6.08 Critical thinking in teaching 1-7 (best)	2.3	21.4 ↓	136
6.09 Pupil-to-teacher ratio in primary education Ratio	13.7	90.7 =	39

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Jeste li znali?...RH?

- Neki od rezultata **Istraživanja hrvatskog kvocijenta inovativnosti 2011.** (Horvath, Čorić, Antoljak, Mitrović, Račić, Radman)...
- U istraživanju se **kreativnost** definira kao „**sposobnost stvaranja novih ideja**“ te „mentalno obilježje koje omogućuje **razmišljanje izvan okvira**, što rezultira **inovativnim** ili različitim **pristupom određenom zadatku**.“
- **Kreativnost** je termin koji se obično koristi za **aktivnost stvaranja novih ideja, pristupa ili aktivnosti**, dok je **inovacija** proces stvaranja i primjenjivanja navedenih **kreativnih ideja u određenom kontekstu**.
- **Tvrtke daju inovativnosti izuzetno visok prioritet u strategiji poslovanja**, ali istovremeno **većina njih uopće nema organiziran sustav** za prikupljanje, procjenu i odabir ideja; **prerijetko uspješno komercijaliziraju ideje**, te **nemaju osobu odgovornu za inovacije**.
- ...u samo **17% tvrtki formalno** postoji osoba, tim ili ured **odgovorni za inovacije**...
- ...čak niti **najbolje ocijenjena tvrtka** prema istraživanju HKI-a nije blizu željenoj razini inovativnosti, ostvarivši samo **78% od maksimalnog broja bodova**....
- ...

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Jeste li znali?...RH?

- Što učiniti kako biste povećali svoj kvocijent inovativnosti?
- 1. **Motivirati zaposlenike da razvijaju vlastitu inovativnost** što povećava i inovativnost tvrtke.
- 2. **Iskoristiti izvore hrvatskih i EU potpora** za razvoju inovativnosti.
- 3. **Sustavno raditi na unaprjeđenju i stalnom moderniziranju** svih procesa unutar organizacije.
- 4. **Uspostaviti ili unaprijediti inovacijski proces** što ubrzava dovođenje kvalitetne ideje do komercijalizacije.

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Motivirati ???

- Koliko zaposlenika je zadovoljno svojim poslom?
- ...
- **9 od 10 ih je nezadovoljno svojim poslom**
- ...
- **A što ih čini zadovoljnima...sretnima...na poslu?**
- ...
- 1. **svrha (intrinzična motivacija)**
- 2. **suradnici**
- 3. **šef**
- ...
- **Don't find a JOB, find a MISSION (Celeste Headlee)**

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Jeste li znali?...RH?

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Priča o 5 majmuna

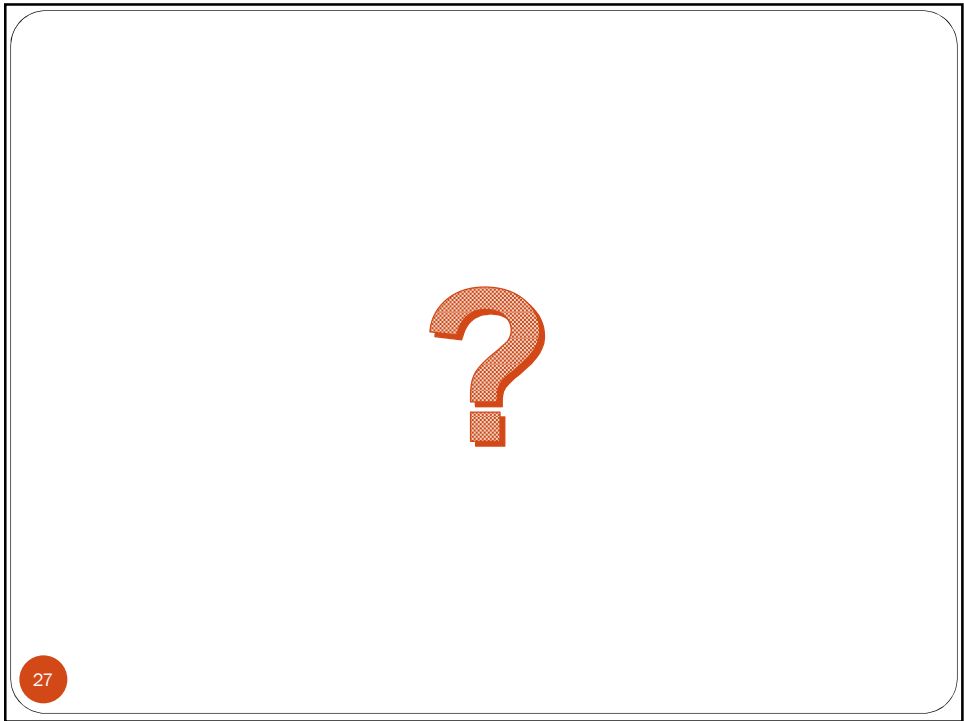
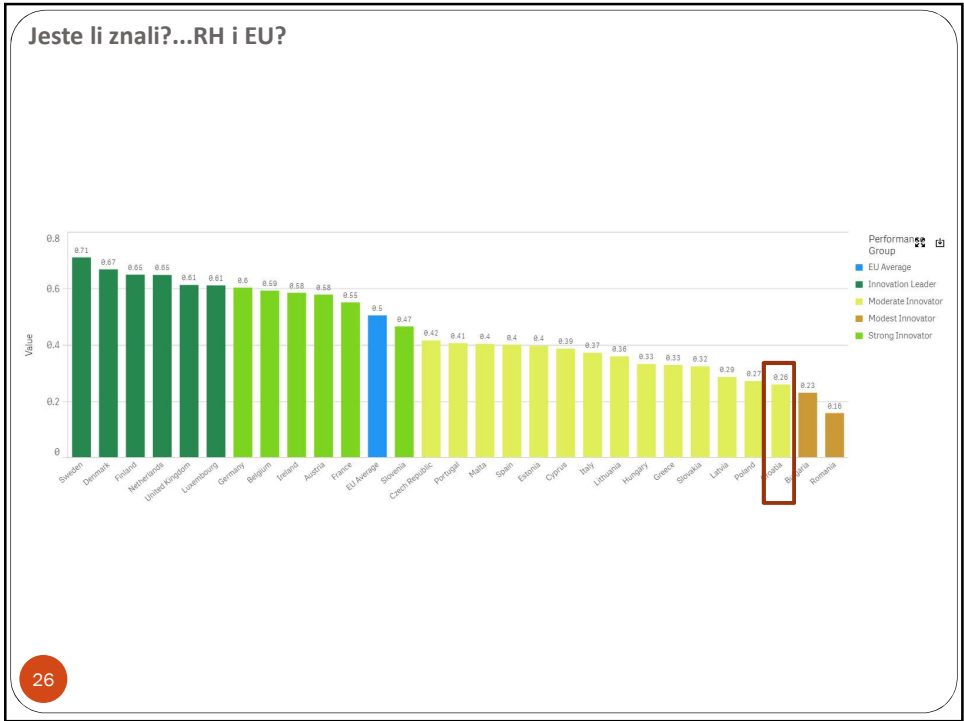
- **Ne propitujemo stvari koje su nam dobro poznate.**
- U velikim organizacijama ljudi uvijek ispočetka rade jednu te istu stvar bez propitivanja politike ili sustava.
- Koliko puta ste čuli: „**Zato što se to ovdje oduvijek tako radi.**“
- **Posljedica???**
- **Zaposlenici koji nisu radoznali i ne zanima ih zašto rade ono što rade**

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Jeste li znali?...RH i EU?



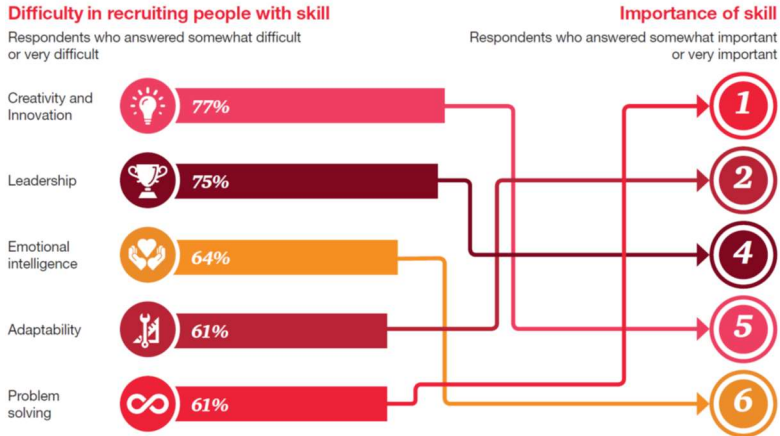
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20th CEO Survey (2016. - PwC)

Figure 9: The hardest skills to find are those that can't be performed by machines

Q: How difficult, if at all, is it for your organisation to recruit people with these skills or characteristics?
 Q: In addition to technical business expertise, how important are the following skills to your organisation?



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PwC Report 2017

Graph 3. Importance of specific skills to CEOs



21st century skills¹

Foundation literacy
 Literacy | Numeracy | Scientific literacy | ICT literacy | Financial literacy | Cultural and civic literacy

Competences
 Critical thinking | Problem-solving | Creativity | Innovation | Communication | Collaboration

Character qualities
 Curiosity | Initiative | Empathy | Persistence/grit | Adaptability | Leadership | Social and cultural awareness | Emotional Agility

Top 10 skills

in 2020

1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility

in 2015

1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgment and Decision Making
9. Active Listening
10. Creativity



Source: Future of Jobs Report, World Economic Forum

WEF 2018., World Economic Forum: **Budućnost poslova**

The Future of Jobs Report 2018

Table 4: Comparing skills demand, 2018 vs. 2022, top ten

Today, 2018	Trending, 2022	Declining, 2022
Analytical thinking and innovation	Analytical thinking and innovation	Manual dexterity, endurance and precision
Complex problem-solving	Active learning and learning strategies	Memory, verbal, auditory and spatial abilities
Critical thinking and analysis	Creativity, originality and initiative	Management of financial, material resources
Active learning and learning strategies	Technology design and programming	Technology installation and maintenance
Creativity, originality and initiative	Critical thinking and analysis	Reading, writing, math and active listening
Attention to detail, trustworthiness	Complex problem-solving	Management of personnel
Emotional intelligence	Leadership and social influence	Quality control and safety awareness
Reasoning, problem-solving and ideation	Emotional intelligence	Coordination and time management
Leadership and social influence	Reasoning, problem-solving and ideation	Visual, auditory and speech abilities
Coordination and time management	Systems analysis and evaluation	Technology use, monitoring and control

Source: Future of Jobs Survey 2018, World Economic Forum.



Kreativno razmišljanje...zašto???

- Podaci razvijenijih (2011.) država ukazuju na veličinu problema:
 - 10 najtraženijih zanimanja u 2010. nije postojalo 2004. godine
 - današnji srednjoškolar će promijeniti 10 do 14 radnih mjesta do svoje 38 godine
 - količina novih tehničkih informacija udvostručuje se svake 2 godine
 - polovica usvojenog znanja na 1. godini studija (za studente koji započinju 4.-godišnji studij) će biti zastarjela do njihove 3.-će godine studija, dakle prije završetka studija....
- 65% današnje djece predškolske dobi bavit će se zanimanjima koja danas još ne postoje (2017.)
- Postavlja se pitanje danas...za budućnost... (2050.):
 - Kako obrazovati učenike za zanimanja koja još ne postoje, koristeći tehnologije koje još nisu osmišljene, tako da budu u mogućnosti rješavati probleme za koje trenutno uopće nisu svjesni da postoje?

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Poslovi...zanimanja... 2050. ???

- Što znamo?
 - SAD...1/2 postojećih poslova će nestati do 2035.
 - UK... 1/3 postojećih poslova će nestati do 2035.
- ...
- Što još znamo?
 - Poslovi koji će "preživjeti"...poslovi koji će tada postojati...imati će jednu dominantnu zajedničku karakteristiku...
 - ...**kreativnost**...
- Zašto se ne pripremamo za poslove budućnost temeljem onoga što znamo?
 - ...
- Novo razdoblje...**knowing is most important...creating is more important...**
- Svijet se neprestano mijenja i moramo dobro razmisliti o **prilagodbi našeg obrazovnog sustava.**

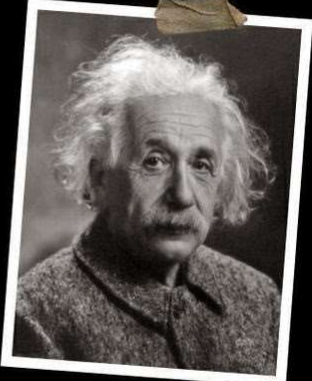
34

Obrazovanje 2050. ???

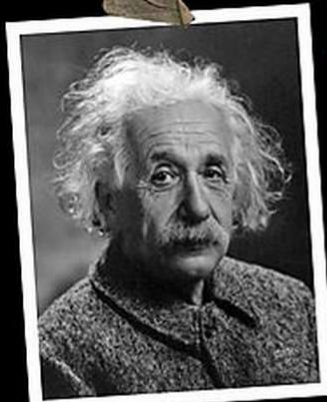
- Kakve će biti škole 2050. godine?
- Kakva će biti uloga učitelja?
- Hoće li u budućnosti učenici "preuzeti školu u svoje ruke"?
- Kako će nove digitalne tehnologije promijeniti učenje?
- Kako digitalna revolucija mijenja obrazovne sustave...učenje u suradnji s kolegama...dematerijalizaciju znanja...**prilagodbu arhitekture škole** raznim načinima učenja...?
- ...
- **Studio škole...43 škole u UK...spoj teorije i prakse..."možemo li kolonizirati Mars?" ...učenje sadržaja, ali u kontekstu**
- ...
- Primjer Coursere...**statistika** ???
- ...*flipped education*...
- ...

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**"Education is not the learning of facts, but the training of the mind to think."
-Albert Einstein**



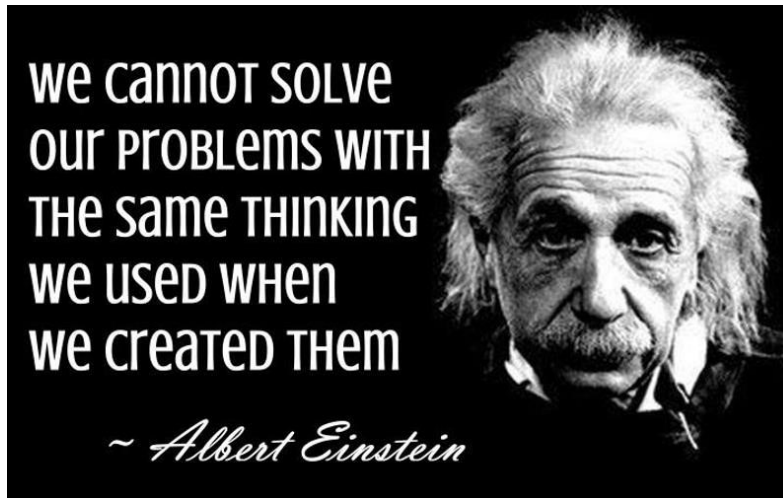
36



“Imagination is more important than knowledge.”
— Albert Einstein

“Imagination is more important than knowledge. For knowledge is limited to all we now know and understand, while imagination embraces the entire world, and all there ever will be to know and understand.”

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...it is a single function device...

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Newsweek: The Creativity Crisis...

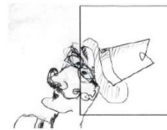
- For the **first time**, research shows that **American creativity is declining**.
- What went wrong—and how we can fix it. ???



by Po Bronson and Ashley Merryman
July 12, 2010

The Creativity Crisis

For the first time, research shows that American creativity is declining. What went wrong—and how we can fix it.



Experts assess 10 drawings by adults and children for signs of out-of-the-box thinking.

The scholars, who judged Schwarzrock to have "unusual visual perspective" and "an ability to synthesize diverse elements into meaningful products."

The accepted definition of creativity is production of something original and useful, and that's what's reflected in the tests. There is never one right answer. To be creative requires divergent thinking (generating many unique ideas) and then convergent thinking (combining those ideas into the best result).

In the 50 years since Schwarzrock and the others took their tests, scholars—first led by Torrance, now his colleague, Garnet Millar—have been tracking the children, recording every patent earned, every business founded, every research paper published, and every grant awarded. They talked the books, danced, radio shows, art exhibitions, software programs, advertising.

Back in 1958, Ted Schwarzrock was an 8-year-old third grader when he became one of the "Torrance kids," a group of nearly 400 Minneapolis children who completed a series of creativity tasks newly designed by professor E. Paul Torrance. Schwarzrock still vividly remembers the moment when a psychologist handed him a fire truck and asked, "How could you improve this toy to make it better and more fun to play with?" He recalls the psychologist being excited by his answers. In fact, the psychologist's session notes indicate Schwarzrock rattled off 25 improvements, such as adding a removable ladder and springs to the wheels. That wasn't the only time he impressed

40

Rano djetinjstvo

- U **ranom djetinjstvu** postoje **različite vrste slobodnih igara** koje se povezuju s **visokom razinom kreativnosti**.
- Djeca predškolske dobi koja provode više vremena u **igranju uloga (glumeći likove)** pokazuju **veću razinu kreativnosti**.
- **Izražavanje tuđeg stajališta** pomaže **razvoju sposobnosti analiziranja situacija iz različitih gledišta**.
- Kada se igraju sami, učenici prvog razreda s izraženom kreativnošću mogu izražavati snažne negativne osjećaje: ljutnju, neprijateljstvo, tjeskobu.
- **Pretpostavlja se da igra predstavlja sigurnu luku** putem koje se mogu prevladati zabranjene misli i emocije.

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Srednje djetinjstvo

- U **srednjem djetinjstvu djeca ponekad stvaraju izmišljene svjetove** – maštarije vezane uz potpuno izmišljene stvarnosti.
- Djeca **redovito, ponekad mjesecima**, iznova **posjećuju svoje izmišljene svjetove**, te čak **osmišljavaju jezike** koji se tamo govore.
- Ovakav **tip igre najviše se manifestira u dobi od 9 ili 10 godina** te vrlo pouzdano upućuje na **visoku razinu kreativnosti** u budućnosti.
- Istraživanje **Državnog sveučilišta u Michiganu** o dobitnicima nagrade „**Genius Award**“ koja se dodjeljuje u sklopu programa MacArthur upućuje na to da su te osobe tijekom djetinjstva pokazale **iznimno visoku stopu stvaranja izmišljenih svjetova**.

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Od četvrtog razreda ...

- Od **četvrtog razreda osnovne škole kreativnost se više ne pojavljuje u izoliranom obliku**; istraživanje i proučavanje postaju sastavni dio pronalaženja korisnih rješenja.
- No, **nije riječ o jednostavnom prijelazu**.
- S obzirom da im **škola nameće sve kompleksnije informacije**, djeca su **preopterećena i njihova kreativnost je narušena**.
- **Ako kreativna djeca imaju učitelje koji ih podupiru** – koji toleriraju **neobičajene odgovore, povremene prekide ili skretanje s teme potaknuto znatiželjom – skloniji su uspjehu**.
- **Kada to nije slučaj, ostvaruju slabije rezultate i u većem broju napuštaju srednju školu ili ne završavaju fakultet**.
- **Zašto odustaju?**

43

Od četvrtog razreda ...

- **Odustaju** zbog **obeshrabrenja** ili **manjka poticanja**, a ne zato što su **sumorni, depresivni, anksiozni ili neurotični**.
- **Pogrešno je te osobine pripisivati kreativnim ljudima.** (Te osobine ustvari guše kreativnost; čine ljude manje otvorenima za iskustva i manje zainteresiranima za nove doživljaje.)
- **Kreativni ljudi** zapravo većinom pokazuju **proaktivne sklonosti i pozitivna raspoloženja**.
- **Angažirani su, motivirani i otvoreni prema ostalima.**

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Jeste li znali?...

- **Djeca predškolske dobi** roditeljima postave u prosjeku oko **100 pitanja na dan**.
 - **Zašto, zašto, zašto** – ponekad roditelji samo žele da to prestane.
 - **Nažalost, zaista i prestane.**
 - U **višim razredima osnovne škole** djeca ih **više-manje prestanu postavljati**.
 - Nije slučajnost da upravo **u tom razdoblju motivacija i angažiranost učenika naglo pada**.
- **Ne prestaju postavljati pitanja zbog izgubljenog interesa, upravo obratno.**
 - **Izgube interes upravo zato što prestanu postavljati pitanja.**

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Schools KILL creativity!

We don't grow into creativity, we grow out of it.

We are educating people out of their creative capacities.

TED Video (2006) - http://www.ted.com/talks/ken_robinson_says_schools_kill_creativity.html
<http://allthingslearning.wordpress.com/>

Važnost kreativnosti

Creativity is as important now in education as literacy and we should treat it with the same status.

Ken Robinson

IMAGE CREDIT: <http://www.wallpapersdesign.net/wallpapers/2012/11/Creativity-Pictures-Hands-Peacock-Art-800x1280.jpg>
<http://allthingslearning.wordpress.com/>

Playground Pedagogy	Three main theories of teaching (Ramsden, 2008)
Playground 1.0 supervised > feeling safe, developing trust	Theory 1: Teaching as telling, transmission or delivery - PASSIVE
Playground 2.0 participatory > gaining playful confidence through guided playful learning	Theory 2: Teaching as organising or facilitating student activity - ACTIVE
Playground 3.0 self-determined > autonomy, developing and sustaining play-active practice	Theory 3: Teaching as making learning possible – SELF-DIRECTED

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1999., Indija > Rupa u zidu
Sugata Mitra

..ako naiđe na potpuno nepoznat predmet, bez značenja, ljudska vrsta ne može odustati dok ne otkrije što je to...

49

Adobe, 2018.

**Technology alone is not the answer,
but it plays a key role**

...nužan, ali ne i dovoljan uvjet...

Robert Kopal & Darija Korkut

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20th CEO Survey (2016. - PwC)

Figure 9: The hardest skills to find are those that can't be performed by machines

Q: How difficult, if at all, is it for your organisation to recruit people with these skills or characteristics?

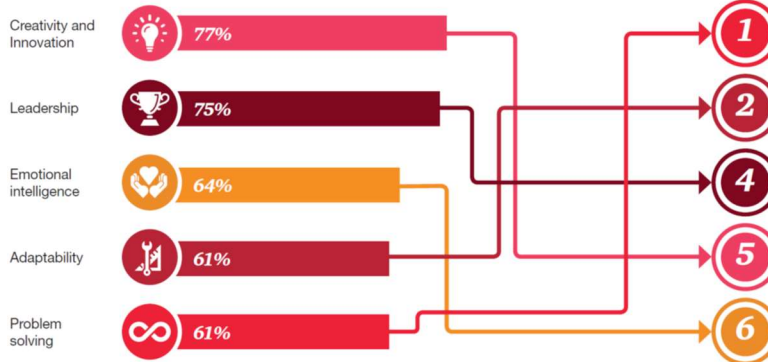
Q: In addition to technical business expertise, how important are the following skills to your organisation?

Difficulty in recruiting people with skill

Respondents who answered somewhat difficult or very difficult

Importance of skill

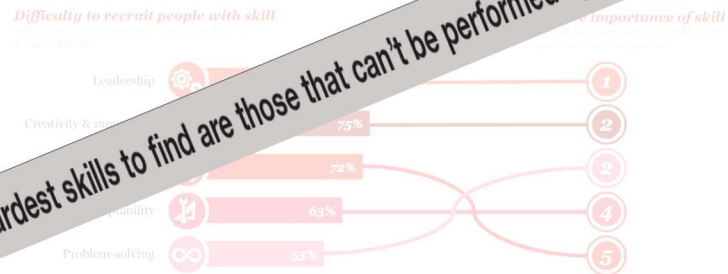
Respondents who answered somewhat important or very important



51

Leadership skills are hard to find

Over two-thirds of Pharma CEOs find it difficult to recruit people with skills they consider most important, including leadership, problem-solving, and creative skills.



Source: PwC, 20th CEO Survey. Base: All Pharma/LS respondents (94)
 Q: In addition to technical business expertise, how important are the following skills to your organization?
 Q: How difficult, if at all, is it for your organization to recruit people with these skills or characteristics?
 20th CEO Survey
 PwC

Digital Dementia

Manfred Spitzer

Ključna je premisa da nas elektronički mediji – pametni telefoni, digitalni asistenti, računala, satelitska navigacija i stalna povezanost s internetom – „oslobađaju“ **uobičajenih mentalnih napora** te stoga postajemo sve ovisniji o tehnologiji, a **naše psihičke sposobnosti slabe**.

Dementia

Michael Mosley

...napredak strojeva, od parnog stroja do stroja za pranje rublja i osobnog računala, značili su da smo morali sve manje raditi fizički...automobili i liftovi premještaju nas...sve se više radi sjedeći...**rezultat**: pretilost, dijabetes tipa 2 i cijeli niz drugih bolesti
 ...razvoj strojeva sposobnih sofisticirano razmišljati, uzrokovati će manje korištenje mozga...**rezultat**: porast bolesti mozga poput demencije koja je u Velikoj Britaniji prvi uzrok bolesti žena...

54

Digital Addiction vs. Digital Detoxication

Robert Kopal & Darija Korkut

"Are our children equipped with digital skills to
minimize the **harmful side-effects** and
maximize the **opportunities** of **technology**?"
 DQ Institute

55

Digital intelligence vs. Creative intelligence

WEF/ DQ Institute

Bruce Nussbaum

...the **sum** of **social, emotional** and **cognitive abilities** that enable individuals to **face the challenges** and **adapt** to the **demands of digital life...**

... **Digital Intelligence (DQ)** are Global Standards for **Digital Literacy, Digital Skills and Digital Readiness...**

...DQ consists of 8 broad areas and across 3 levels...

... **Create, Connect,** and **Inspire...**...new form of cultural literacy and a powerful method for **problem-solving, driving innovation...**

... **CQ**— how that translates into their abilities to solve new problems and/or make new products...

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Digital Citizenship

The ability to use digital technology and media in safe, responsible and effective ways.

Digital Creativity

The ability to become a part of the digital ecosystem by co-creating new content and turning ideas into reality by using digital tools.

Digital Entrepreneurship

The ability to use digital media and technologies to solve global challenges or to create new opportunities.

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61

...CQ as the **ability to frame problems in new ways** and to make **original solutions**...you can have a low or high ability to frame and solve problems, but these **2 capacities are key and they can be learned**... **new type of economic system** where **creativity** is the **source of value**, where **entrepreneurs drive growth**, and where **social networks** are the **building blocks** of the **economy**...



Dijete može učiniti sve što želi.

I želi samo ono što može.

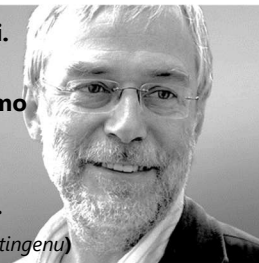
Arno Stern (Closlieau)

Painting-Play Servant.

**Ne možete nekoga prisilno obrazovati.
Neurološki je to nemoguće.
Može se samo sâm obrazovati, i to samo
ako to i želi.**

**Ne možete nekoga prisiliti da se želi
obrazovati, nego samo ohrabriti za to.**

Gerald Hüther (Sveučilište u Göttingenu)



Radoznalost. Motivacija.

Adobe Research - 2018

<http://cps.adobeeducate.com/>

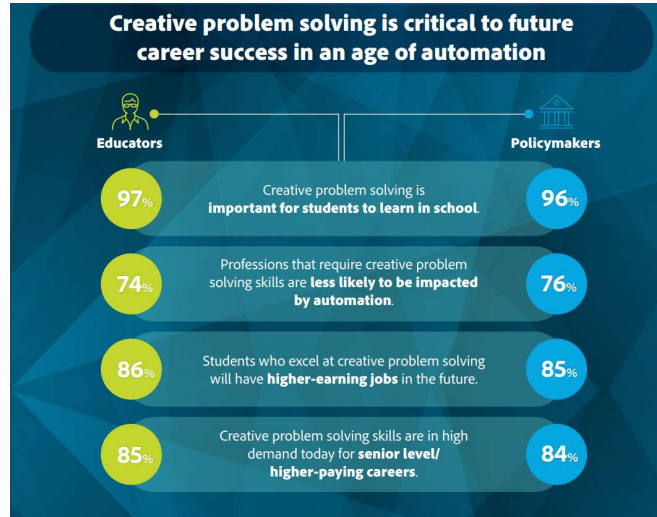


Adobe Research

***Kreativno rješavanje problema** je proces redefiniranja problema i mogućnosti, koji rezultira inovativnih odgovorima i rješenjima te, naposljetku, i poduzimanjem akcije*

- Globalno istraživanje pokazuje da poslovni sutrašnjice zahtijevaju **problem-solving vještine**
- Pitanje za 1.600 ispitanika među obrazovnim kadrom višeg i srednjeg obrazovanja te 400 *policymaker*-a i *influencer*-a širom svijeta: **kako se đaci i studenti pripremaju za kreativno rješavanje problema.**

Adobe Research



Adobe Research



OK, očigledno trebamo nešto poduzeti..

- 3 tipa ljudi:
 - Those who are **immovable** – people who don't get it, or don't want to do anything about it
 - People who are **movable** – people who see the need for change and are prepared to listen to it
 - People who **move** – people who make things happen.
- U koju kategoriju pripadate?

Benjamin Franklin

Pitanje:

- **Možemo li primjenjivati neke kreativne tehnike u nastavi ???**

Odgovor:

- **DA !!!**
- **Sve !!!**

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Kreativnost i inovativnost u nastavi: primjer 1/2

- **Mentalna kalibracija kreativnosti**
- **Vježbe kreativnog razmišljanja**
- **Analogije**
- **Mentalna kalibracija kreativnosti - nastavnici**

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Kreativnost i inovativnost u nastavi: primjer 2/2

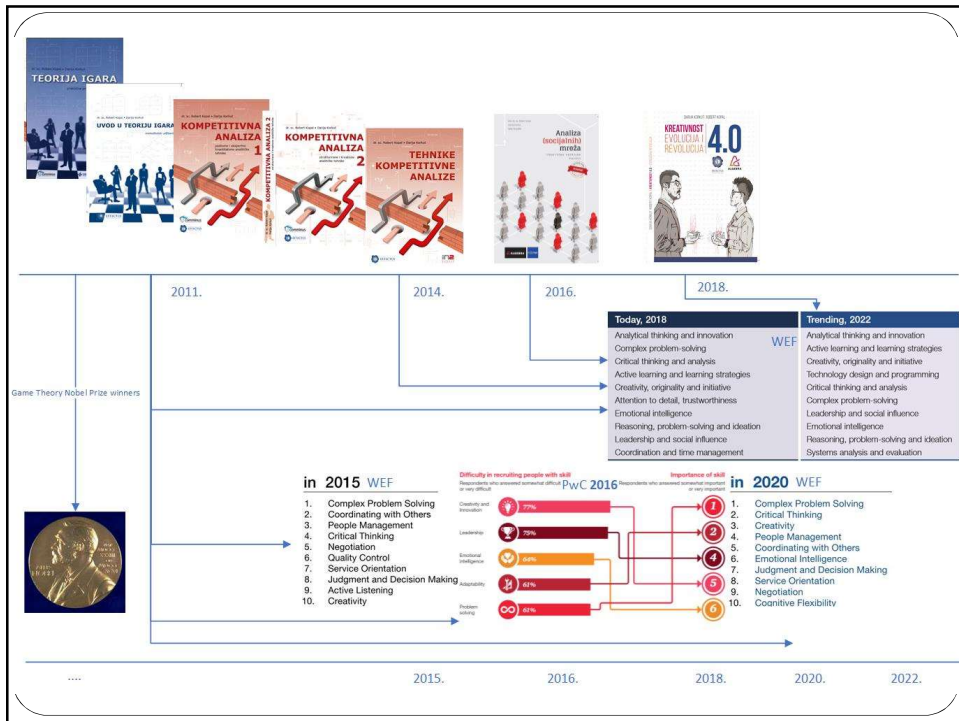
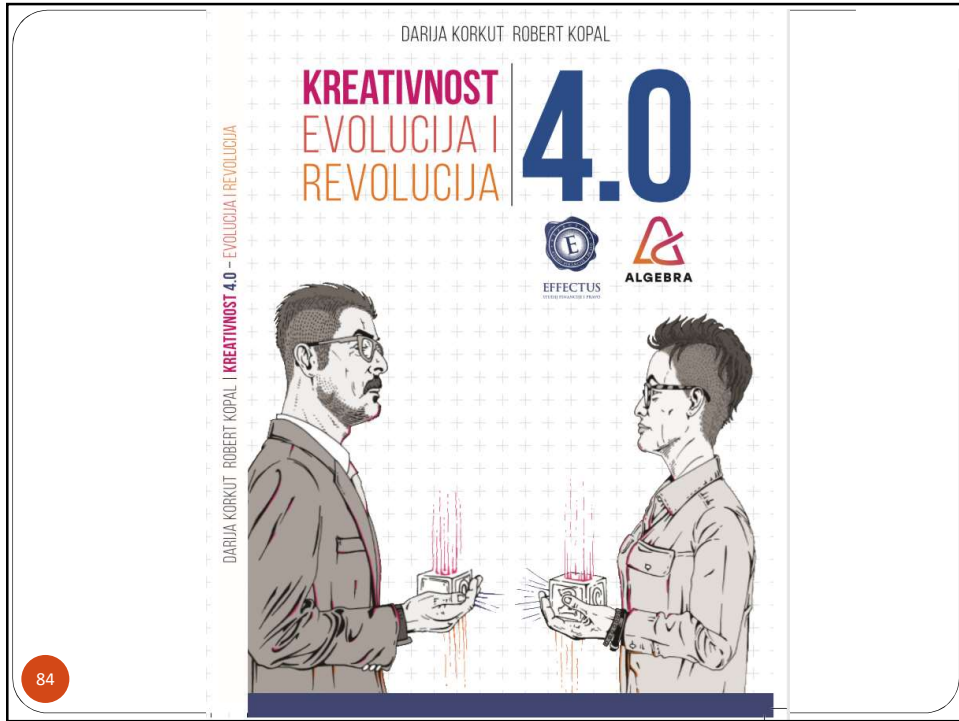
- tehnika kreativnog mišljenja (*framing – problem definition*):
 - **Preformulacija problema (*Problem Restatement*)**
- tehnika kreativnog mišljenja (*idea generation*):
 - **Strukturirani brainstorming (*Structured Brainstorming*)**
- tehnika kreativnog mišljenja (*connect & combine*):
 - **Krug mogućnosti (*Circle of Opportunity*)**
- tehnika kreativnog mišljenja (*challenging assumptions*):
 - **Zamjena (*False Faces*)**
- tehnika odlučivanja (*decision making*):
 - **6 šešira (*6 hats*)**
 - **Ponderiranje (*Weighted Ranking*)**

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Nebeske tkanine, William Butler Yeats

- Da imam nebeske tkanine vezene,
- Zlatnim i srebrnim svjetlom ispletene,
- Tkanine plave i zagasite i tamne
- Od noći i svjetla i polutame,
- Ja bih ih raširio pred tvoja stopala:
- Ali siromašan sam, imam tek snove;
- **Raširio sam snove pred tvoja stopala;**
- **Hodaj nježno jer hodaš po mojim snovima.**
-
- **Svaki dan...svugdje...naša djeca raširuju svoje snove pred naša stopala...**
- **...i zato trebamo hodati nježno...**

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Od 1.1.2019.....**Kreativno učilište**

www.kreativnouciliste.com

by Robert Kopal & Darija Korkut



Vizija: **kreativna Hrvatska.**
Misija: **vještine budućnosti danas.**

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Kreativnost i inovativnost u nastavi

Doc.dr.sc. Robert Kopal

