

## REZULTATI

### Izvirni znanstveni članki

PRAZNIK, Miha, BUTALA, Vincenc, ZBAŠNIK-SENEGAČNIK, Martina. Simplified evaluation method for energy efficiency in single-family houses using key quality parameters. Energy and buildings, ISSN 0378-7788. [Print ed.], Dec. 2013, vol. 67, str. 489-499.

PRAZNIK, Miha, BUTALA, Vincenc, ZBAŠNIK-SENEGAČNIK, Martina. A simple method for evaluating the sustainable design of energy efficient family houses. Strojniški vestnik, ISSN 0039-2480, Jun. 2014, vol. 60, no. 6, str. 425-436

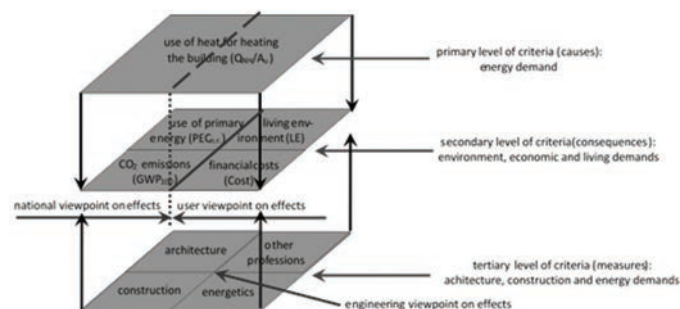
### Mentorstvo pri doktoratu

PRAZNIK, Miha. Kvalitativni parametri za energijsko učinkovite enodružinske hiše : doktorska disertacija = Quality parameters for the energy single-family houses : doctoral thesis. [Ljubljana: M. Praznik], 2014. XVII, 171 str.

methods and tools ensures that planners use it in the idea phase so that they seek the most optimal design for the building from the beginning.

### KEY WORDS

energy efficiency, sustainable concept, single family house, simplified method, simplified tool



Slika 9: Prikaz prvih dveh nivojev zahtev oz. kriterijev za vrednotenje, s petimi ključnimi indikatorji.

Figure 9: Representation of the first two levels of demand or the criteria for evaluation using 5 key indicator.

### Domen Kušar

#### SPREMEMBE TESTA MISELNE ROTACIJE

### POVZETEK

Ena izmed inteligenc, ki med drugim zajema lingvistično, matematično, glasbeno, gibalno itd., je prostorska inteligenca. Sestavni del slednje je prostorska predstava. Ta sposobnost je ključna za vse osebe, vpletene v proces oblikovanja in upravljanja s prostorom. Proučevanje prostorske predstave je relativno mlada disciplina. Za začetnika raziskav s tega področja se smatra Sir Francis Galton, ki je leta 1880 poročal o svojih eksperimentalnih raziskavah na področju miselne predstavljalivosti. Hkrati s preučevanjem prostorske predstave so se razvijali tudi različni instrumenti – testi za njeno vrednotenje. Eden izmed standardnih splošno razširjenih testov je test miselne rotacije (Mental rotation test – v nadaljevanju MRT), ki pa je tudi povzržen razvijanju, zlasti na Japonskem. Na Fakulteti za arhitekturo MRT uporabljamo za ugotavljanje prostorske predstave študentov in vrednotimo tudi sam test. Na osnovi rezultatov smo skupaj s kolegi iz Budimpešte predlagali spremembe točkovanja MRT. Rezultati obstoječega sistema točkovanja namreč niso ustrezali pričakovani normalni razporeditvi. S predlagano rešitvijo smo odpravili anomalijo obstoječega testa in to dokazali z rezultati testiranja študentov v Ljubljani in Budimpešti (tabela 1). Rezultati raziskave so bili predstavljeni v članku: Bölcseki, A., Kovács, A. Z., Kušar, D. (2013): New ideas in scoring the Mental rotatin test. V: Ybl Journal of built environment, 2013/1, str.: 59-69 in na znanstvenih konferencah v Innsbrucku ter v Supetru poleti 2014.

### UPORABNOST REZULTATOV

MRT je splošno uporabljan test po vsem svetu. Rezultati predlagane spremembe načina ocenjevanja pomenijo novost

#### CHANGES OF MENTAL ROTATING TEST (MRT)

### SUMMARY

Spatial intelligence is one of the human intelligences (other abilities are linguistic, mathematical, musical, physical, etc...). An integral part of spatial intelligence is spatial ability. This ability is crucial for all parties involved in the process of creating and managing space. Spatial ability is a relatively young discipline. For the originator of the research in this area is considered Sir Francis Galtna. He reported about his experimental research in the field of mental visualization in 1880. Parallel with the study of spatial ability, they have also developed various testing instruments. One of the widely used standard test is Mental rotation test (MRT). Nevertheless, it has been developing, especially in Japan. At the Faculty of Architecture, we use MRT to determine the spatial ability of students. At the same time, we also evaluate the test itself. Based on our results, and together with colleagues from Budapest, we proposed changes to the scoring system of MRT. The results of the current scoring system did not fit to the expected normal distribution. We eliminated the anomaly of existing test in proposed the solution. This was proven by the results of students in Ljubljana and Budapest (Table 1).

The survey results were presented in the article: Bölcseki, A., Kovács, AZ, Kušar, D. (2013): New ideas and scoring the Mental rotatin test. In: Ybl the Journal of the built environment, 2013/l, p.: 59-69 and on scientific conferences in Innsbruck and in Supetar on summer of 2014.

### ISSUES AND THEIR SIGNIFICANCE

MRT test is widely used around the world. The results of the proposed changes in scoring system means a novelty in this

na tem področju, kar je bilo opaziti po predstavitev rezultatov v Innsbrucku in Supetru. Rezultati raziskave bodo tako pripomogli k optimizaciji MRT. To pa bo vodilo k bolj realnemu ugotavljanju prostorske predstave.

### KLJUČNE BESEDE

prostorska predstava, test miselne rotacije

*field. This was observed after the presentation in Innsbruck and Supetar. The survey results will also help to optimize the MRT. This will lead to a more real determining of spatial ability.*

### KEY WORDS

*spatial ability, mental rotation test*

Slika 10: Rezultati ustreznosti normalni porazdelitvi pri starem in novem sistemu točkovanja.

Figure 10: Normality test by  $\chi^2$  distribution at old and new scoring system.

Group of students	Old scoring system		New scoring system	
	Computed $\chi^2$ statistic	Answer to $H_0$ (at 95% $\chi^2 \approx 52.19$ )	Computed $\chi^2$ statistic	Answer to $H_0$ (at 95% $\chi^2 \approx 52.19$ )
Overall – Ybl Faculty of SzLU	71.23	NO	35.50	YES
Men – Ybl Faculty of SzLU	73.25	NO	69.90	NO
Women – Ybl Faculty of SzLU	35.81	NO	20.42	YES
Overall – UL FA	74.61	NO	46.50	YES
Men – UL FA	55.48	NO	47.99	YES
Women – UL FA	68.99	YES	34.37	YES

Matevž Juvančič

### DIALOG IN IZOBRAŽEVANJE O PROSTORSKIH TRAJNOSTNIH VPRAŠANJIH V ARHITEKTURI IN URBANIZMU

### DIALOGUE AND EDUCATION ABOUT SPATIAL SUSTAINABLE ISSUES IN ARCHITECTURE AND URBAN DESIGN

#### POVZETEK

Na področju dialoga in izobraževanja o trajnostnem prostorskem razvoju v arhitekturi in urbanizmu, gre izpostaviti nekaj raziskav in iz njih izhajajočih prispevkov ki so v zadnjem času obravnavale med-disciplinarno in medgeneracijsko sodelovanje v procesu oblikovanja prostora. Pri vprašanih vzgoje za trajnostni prostorski razvoj, nas je zanimalo predvsem, kako mlajše generacije razumejo ta pojem in kaj si pod njim predstavljajo, saj slednje postavlja temeljna izhodišča za nadaljnje delovanje na tem področju. Študija [Svetina et al., 2013] prinaša interdisciplinarni pristop k preučevanju razumevanja trajnostnega razvoja grajenih okolij s strani otrok in mladostnikov. Koncept trajnosti implicira zapletene odnose med etičnimi, ekonomskimi, socialnimi, tehničnimi in drugimi lastnostmi. Koncept je težko razumljiv za otroke, ki še nimajo razvitih sposobnosti abstraktnega in večdimenzionalnega mišljenja. Za preverjanje razumevanja trajnostnih konceptov s strani otrok in adolescentov smo razvili in uporabili metodo vizualnega jezika in jo aplicirali na vzorcu preko 2000 sodelujočih, starih od 6 do 19 let. Vsesplošno razumevanje in interpretacijo prostorskih informacij o urbanih okoljih je obravnavalo več prispevkov, ki so se ukvarjali z uvajanjem novega pristopa k razumevanju kompleksnih informacij in delovanja urbanih prostorov s strani ne-strokovne javnosti. Verovšek, Juvančič in Zupančič [2013a] opisujejo koncept modela za interpretacijo kvalitet urbanih prostorov. Cilji modela so trije: prvič, oblikovanje enotnih, veljavnih in uporabnih metod, za ocenjevanje značilnosti oblikovanja prostora; drugič, navesti razvojne lastnosti prostorov, ki bistveno vplivajo na uporabnikovo izkušnjo, ki - kot posledica - izhaja iz preudarnih oblikovalskih rešitev ali pomanjkljivega urbanističnega oblikovanja; tretjič, razviti generični jezik vizualne predstavljivosti urbanih prostorov za komunikacijske namene (slika 10). Model predstavlja identifikacijsko metodo in je namenjen prepoznavanju ključnih informacij oziroma 'zgodbe',

#### SUMMARY

Several recent studies and scientific contributions have addressed the dialog methods and education in sustainable spatial development in architecture and urbanism, which at the same time also dealt with interdisciplinary and inter-generation communications and lifelong learning on the process of urban design. For education purposes on the topic of sustainable spatial development, we were interested in how the younger generations come to understand this notion. This fundamental understanding will direct further efforts in that segment. The study [Svetina et al, 2013] provides an interdisciplinary account determining how children and adolescents understand urban and architectural aspects of sustainable development. The concept of sustainability implies complex relations between ethical, economic, social, technical and other qualities of our environment. The concept is difficult to understand for children who lack the abilities of abstract reasoning and multi-dimensional thinking. A new measure of sustainability understanding was formed based on pictorial rather than textual format and was applied to a large sample of over 2000 participants aged 6–19 years. The general understanding and interpretation of spatial information on urban environments were addressed by several contributions, which dealt with a novel approach to understanding the complex information and logics of urban spaces by the non-expert public. Verovšek, Juvančič in Zupančič [2013a] propose a model for interpretation of qualities in urban space. The objectives are threefold: first, to form common, valid and applicable measures to assess features of space design, second, to indicate the developmental trait that considerably affect user's spatial experience which – taken as a consequence – derives from either sustainable/prudent or poor design decisions; and third, to generically recreate and visually represent urban spaces for communicative purposes (figure 4).