



# Доказательное образование: как учебная и психометрическая аналитика помогают в разработке онлайн-курсов

**Дмитрий Аббакумов**

PhD KU Leuven

руководитель Центра вычислительных наук об образовании НИУ ВШЭ

# Элементы доказательного образования

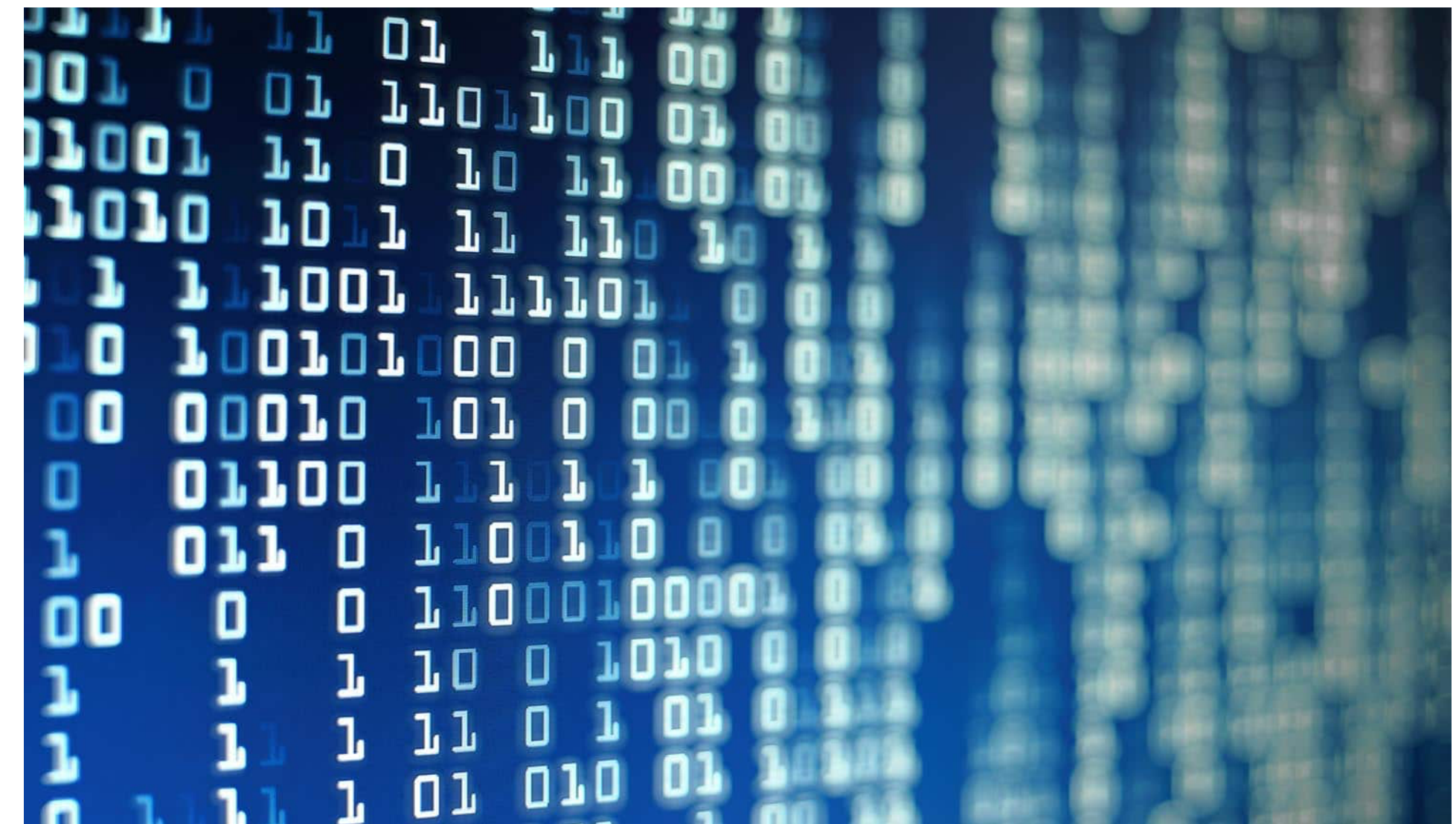
- Данные
- Аналитика
- Пользователь как со-разработчик
- Инструменты с фокусом на удобство пользования

# Элементы доказательного образования

- Данные
- Аналитика
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- Инструменты с фокусом на удобство пользования

# Данные

- Регистрируемые действия
- Анкеты, опросы, интервью
- Clickstream



# Элементы доказательного образования

- Данные
- Аналитика
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- Инструменты с фокусом на удобство пользования

# Аналитика

- Психометрика – педагогические и психологические измерения

<h1>SCIENCE</h1>	
Vol. 85	FRIDAY, MARCH 5, 1937
No. 2201	
<p><i>Psychology as a Quantitative Rational Science: Problems.</i> L. L. THURSTONE</p> <p><i>Obituary: Edward Curtis Franklin; PROFESSOR C. A. KRAZE. Recent Deaths and Memorials</i></p> <p><i>Scientific Events: The Columbia University School of Medicine; The Electronics Institute at the University of Michigan; The Wisconsin Alumni Research Foundation; Meeting of Texas Geologists; The Poster Lecture Session at the University of Buffalo; The Installation of a Chapter of Sigma Xi at the George Washington University</i></p> <p><i>Scientific Notes and News</i></p> <p><i>Discussion: Discrimination of Scientific Literature by Means of Microfilm; DR. ARTHUR SEDGWICK. Microphotography or Photo-micrography; PROFESSOR W. J. LEVINE. A Vapourour Local Abolitionist; PROFESSOR CHARLES H. LEAKE. The Action of Keratin and its Analogues on Skeleton Muscle; Z. M. BACE and G. L. BROWN</i></p> <p><i>Scientific Books: Recent Physics; PROFESSOR HERSEY CROW. Nuclear Physics; PROFESSOR ALAN C. G. MITCHELL.</i></p>	<p><i>Special Articles: Titania, B, and the Growth of Excised Tomato Roots; DR. WILLIAM J. ROBBINS and MARY A. BARTLEY. The Significance of the Address for Jodification; PROFESSOR HANS SEITZ. The Synthesis of Substances Related to Lysergic Acid; DR. WALTER A. JACOBS and DR. R. GORDON GORDON, JR.</i></p> <p><i>Scientific Apparatus and Laboratory Methods: The Automatic Dehydrating Device; JEAN PENNINGTON and DR. C. P. HICKMAN. The Isolation of Myxobacteria; KENNETH CROSBY.</i></p> <p><i>Science News</i></p> <p><i>SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. McKENN CATELL and published every Friday by</i></p> <p style="text-align: center;"><b>THE SCIENCE PRESS</b></p> <p style="text-align: center;">New York City: Grand Central Terminal Lancaster, Pa. Annual Subscription, \$6.00      Single Copies, 15 Cts</p> <p><i>SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership and subscription should be sent to the office of the permanent secretary, in the Smithsonian Institution Building, Washington, D. C.</i></p>

PSYCHOLOGY AS A QUANTITATIVE RATIONAL SCIENCE<sup>1</sup>

By Professor L. L. THURSTONE  
THE UNIVERSITY OF CHICAGO

THE purposes of this society are not new, but they represent an emphasis and direction which have not hitherto received major consideration in psychological science. It seems proper that we should devote some share of our first program meeting to a consideration of our main objectives.

Our main purpose is briefly stated in the subtitle of the new journal, *Psychometrika*, namely, to encourage the development of psychology as a quantitative rational science. More briefly, this may be called mathematical psychology. We should justify our emphasis upon quantification and upon rationalization in science, as well as our conception of the fundamental nature of science.

I assume that we are in complete agreement that we can not suddenly quantify our comprehension of psy-

<sup>1</sup> Abstract of address by the retiring president of the Psychometric Society at Hanover, N. H., September 4, 1936.

psychological phenomena over their entire range. As psychologists, we are as interested as ever in making exploratory studies of new psychological effects and in discovering hitherto unknown effects. At present, the range of psychological phenomena that can be profitably reduced to mathematical formulation is limited, and it is likely that every man who works on a problem of mathematical psychology will also concern himself with exploratory studies of other problems that are as yet too new for detailed rationalization.

After the discovery of a psychological effect, we naturally turn to the second phase of scientific inquiry, namely, to relate the new effect in a simple descriptive manner to what is already known. In this stage theories are devised to explain the experimentally known effects, and we try, of course, to make psychological theories less complicated than the effects that are to be explained. In this phase the descriptions of psycho-



# Аналитика

- Психометрика – педагогические и психологические измерения

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**KU LEUVEN** FACULTY OF PSYCHOLOGY AND EDUCATIONAL SCIENCES 

Methodology of Educational Sciences Research Group  
ITEC, imec research group at KU Leuven

## Psychometrics of MOOCs: How to Measure Proficiency?

Dmitry Abbakumov

Doctoral thesis offered to obtain the degree of  
*Doctor of Educational Sciences*

Supervisor: Prof. Dr. Wim Van den Noortgate  
Co-supervisor: Prof. Dr. Piet Desmet

VOLUME 35, Number 3	July-September 2010
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<h1>APPLIED MEASUREMENT</h1>	
<hr/>	
<h2>SPECIAL ISSUE</h2>	
<h3>Using Human Ratios in Constructed Response Scoring: Understanding, Predicting, and Modifying Performance</h3>	
<i>Guest editors: Richard W. Wolfe and Cindy R. Mueller</i>	
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## Behavior Research Methods

What are some things that I can do?

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PSYCHONOMIC  
SOCIETY

# Аналитика

- Психометрика – педагогические и психологические измерения
- Методология наук об образовании



# Аналитика

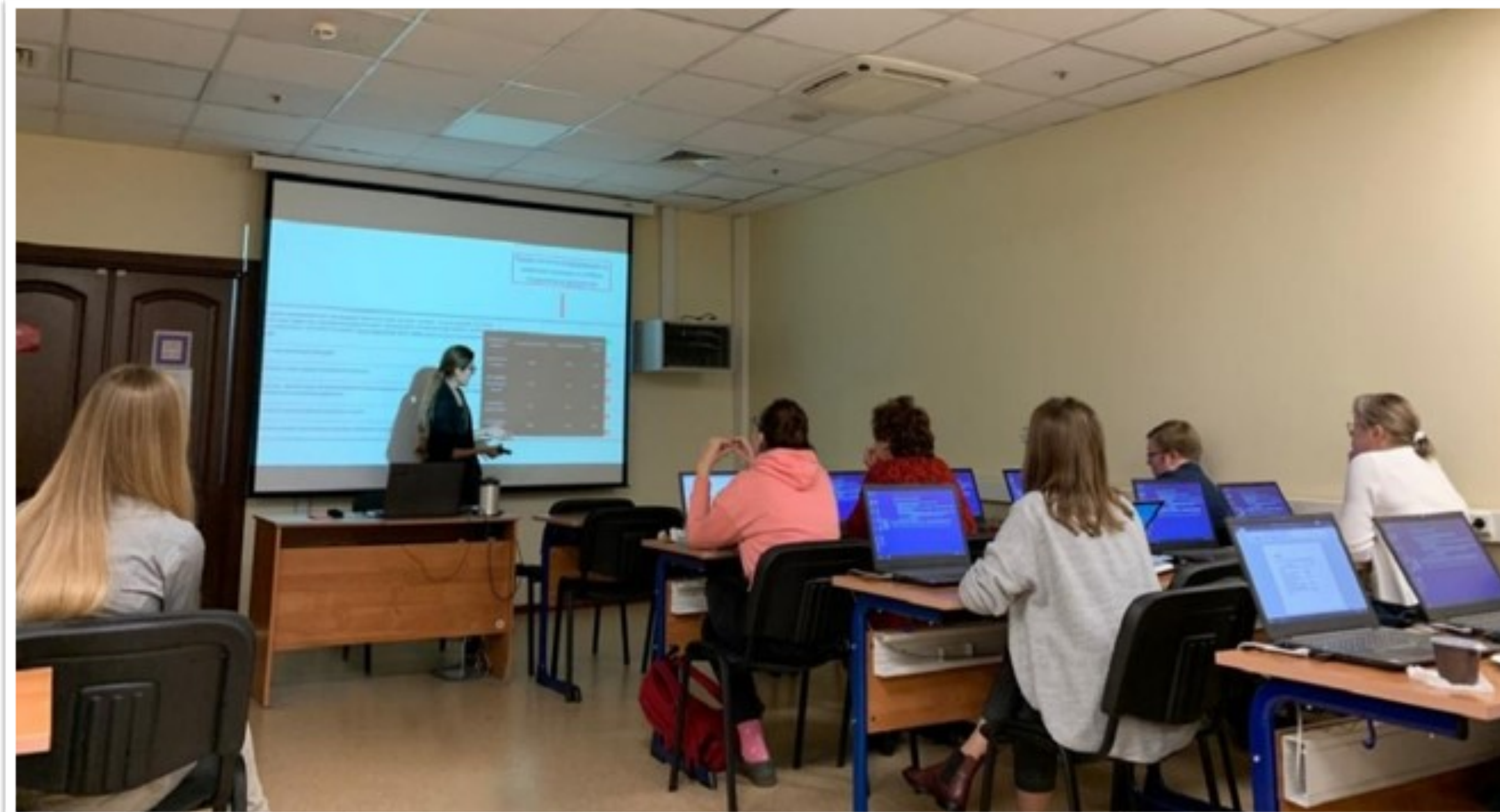
- Психометрика – педагогические и психологические измерения
- Методология наук об образовании
- Наука о данных (машинное обучение, программирование)

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# Мастерские


Разрабатываем инструменты вместе с будущими пользователями.






# Международный семинар

Обмениваемся экспертизой.



Center for Computational Educational Sciences, eLearning Office of HSE University  
Open Lab for Psychometrics of Digital Learning ([www.psychometrics.digital](http://www.psychometrics.digital))  
and personally **Dr. Dmitry Abbakumov**  
are kindly inviting you to **The 1st International Online Seminar on Computational Educational Sciences**




**Carlos Felipe Rodriguez Hernandez**  
*KU Leuven, Belgium*


**An artificial neural network analysis  
of academic performance in higher education**

**April 9, Thursday**  
**18:00** Moscow Time Zone  
**Online**

<https://elearning.hse.ru/ces/international>




Center for Computational Educational Sciences, eLearning Office of HSE University  
Open Lab for Psychometrics of Digital Learning ([www.psychometrics.digital](http://www.psychometrics.digital))  
and personally **Dr. Dmitry Abbakumov**  
are kindly inviting you to **The 3rd International Online Seminar on Computational Educational Sciences**




**Diego Andres Olaya Lasso**  
*Vrije Universiteit Brussel, Belgium*

**Uplift Modeling for preventing  
student dropout in higher education**

**September 3, Thursday**  
**18:00** Moscow Time Zone  
**Online**



Center for Computational Educational Sciences, eLearning Office of HSE University  
Open Lab for Psychometrics of Digital Learning ([www.psychometrics.digital](http://www.psychometrics.digital))  
and personally **Dr. Dmitry Abbakumov**  
are kindly inviting you to **The 2nd International Online Seminar on Computational Educational Sciences**



**Dr. Guillermo Santamaría-Bonfil**  
*National Council for Science and Technology, Mexico*

**Learning analytics for student modeling  
in virtual reality training systems**

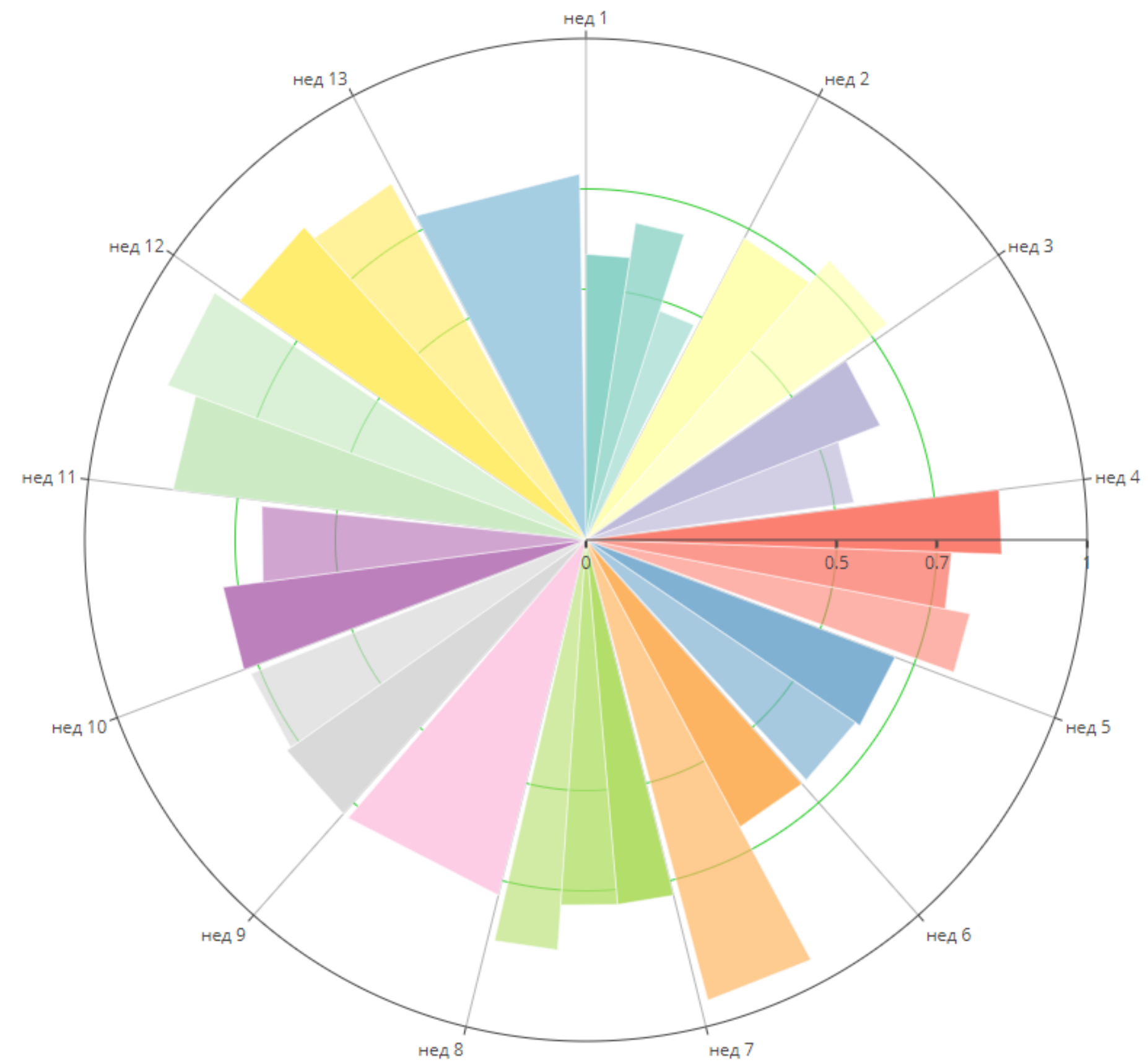
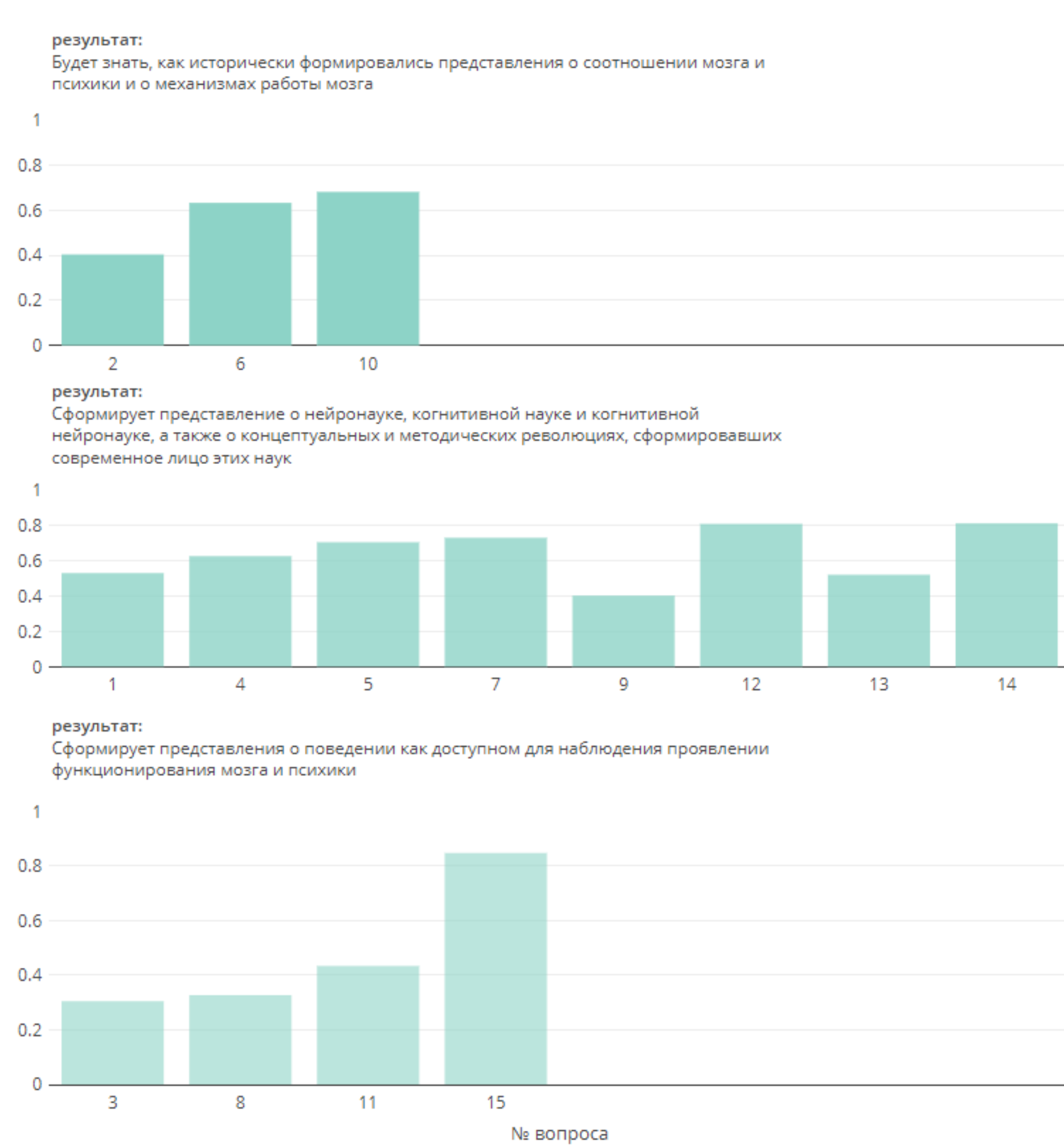
**June 25, Thursday**  
**18:00** Moscow Time Zone  
**Online**

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# Инструменты: преподавателю





# Инструменты: преподавателю

Карта решаемости заданий курса *Психология коммуникации*



Дискриминативность заданий курса *Психология коммуникации*



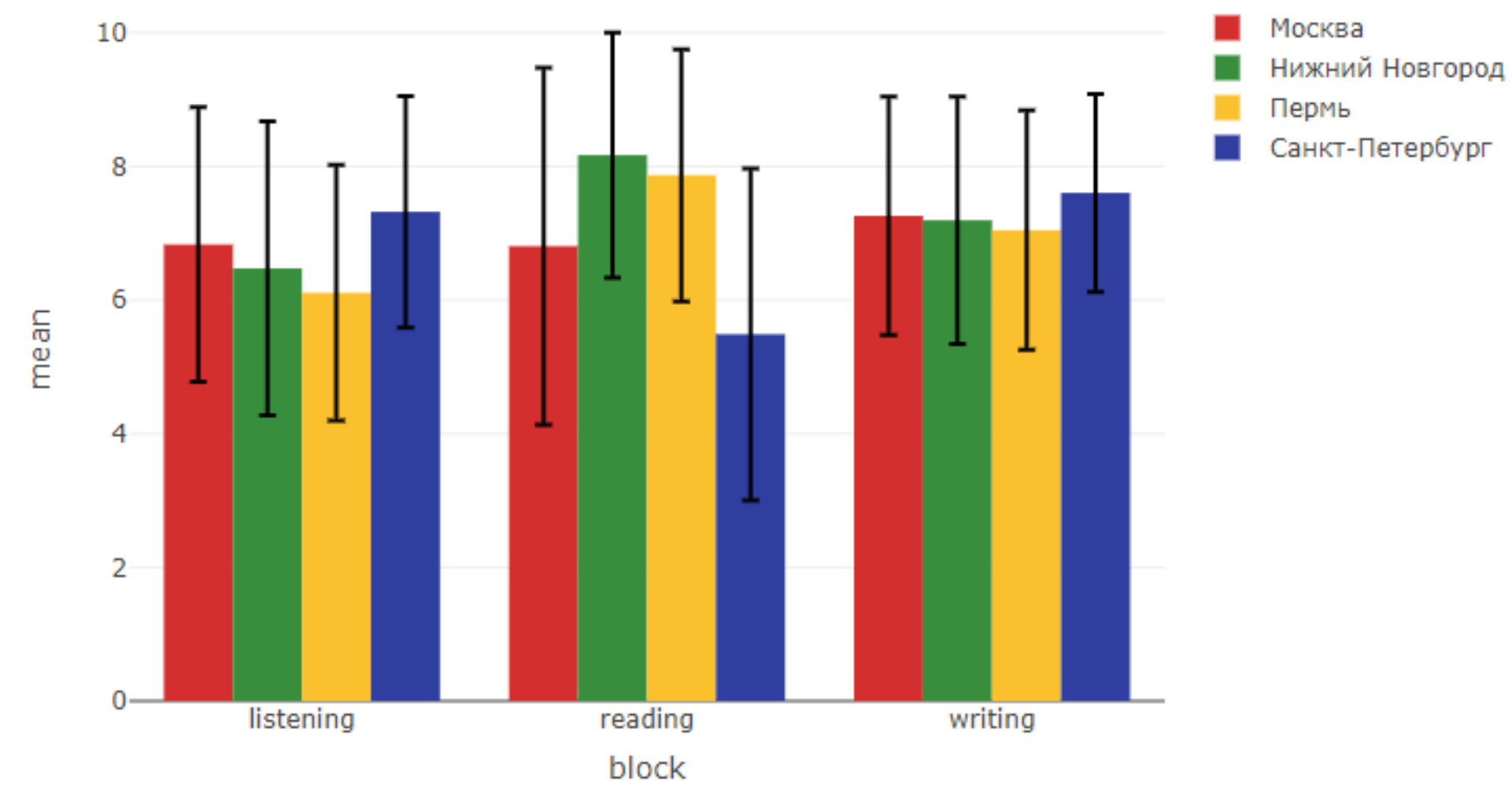
# Инструменты: преподавателю



# Инструменты: менеджменту

## Средние баллы по отдельным блокам (по кампусам)

На графике сравниваются средние баллы, полученные студентами по блокам в разных кампусах.  
Горизонтальные отрезки - это  $\pm$  среднее отклонение.



# Инструменты: менеджменту

## Сравнение результатов отдельных ОП

Выберите несколько программ, которые нужно сравнить. Ниже на графиках отобразится информация о распределении баллов по блокам и средних баллах, а также отфильтрованная часть общей таблицы, касающаяся этих программ.

Выберите программы для сравнения

M: Бизнес-информатика

M: Дизайн

M: Городское планирование

M: Журналистика

M: Информационная безопасность

Show 20 entries

Search:

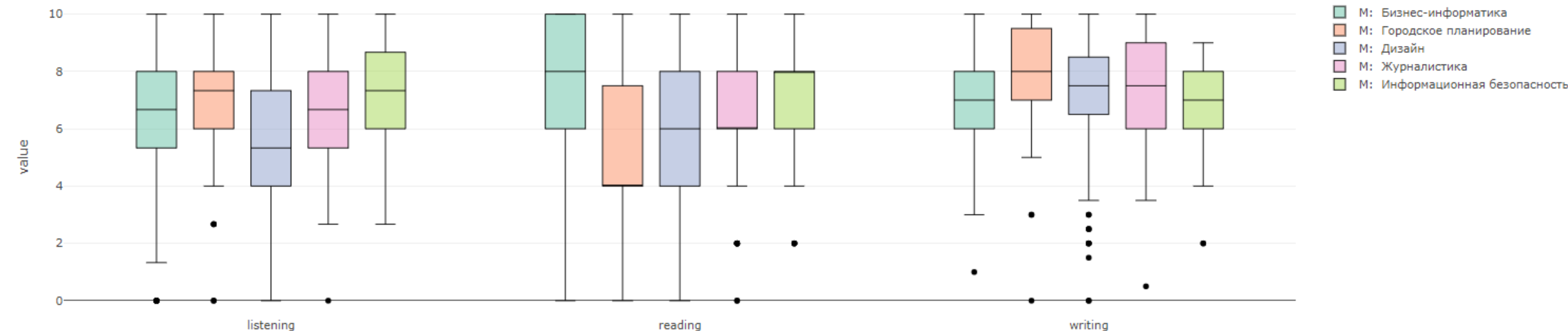
	Кампус	ОП	Аудирование	Чтение	Письмо	Итог	Оценка	Кол-во
1	Москва	Бизнес-информатика	6.57	7.63	7.01	21	7.02	292
2	Москва	Городское планирование	6.9	5.11	7.91	19.69	7.07	99
3	Москва	Дизайн	5.54	5.28	7.31	17.71	6.19	436
4	Москва	Журналистика	6.56	6.69	7.33	20.35	6.93	130
5	Москва	Информационная безопасность	7.16	7	6.71	20.74	6.76	50

Showing 1 to 5 of 5 entries

Previous

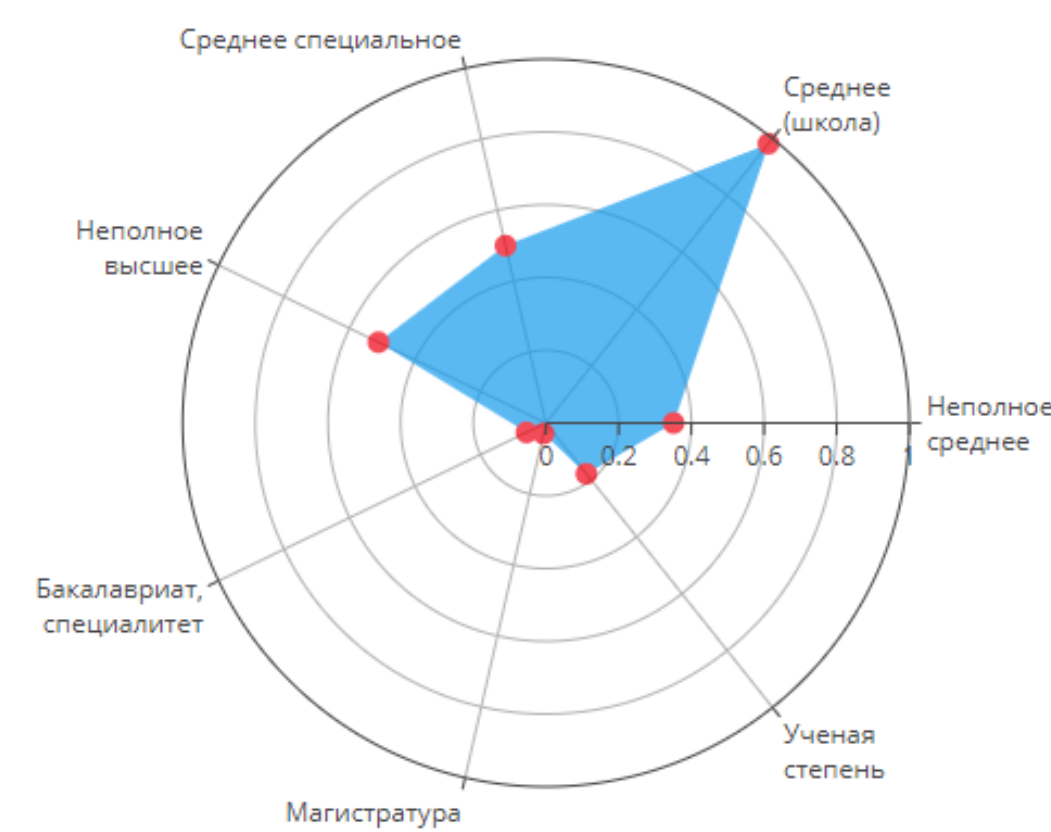
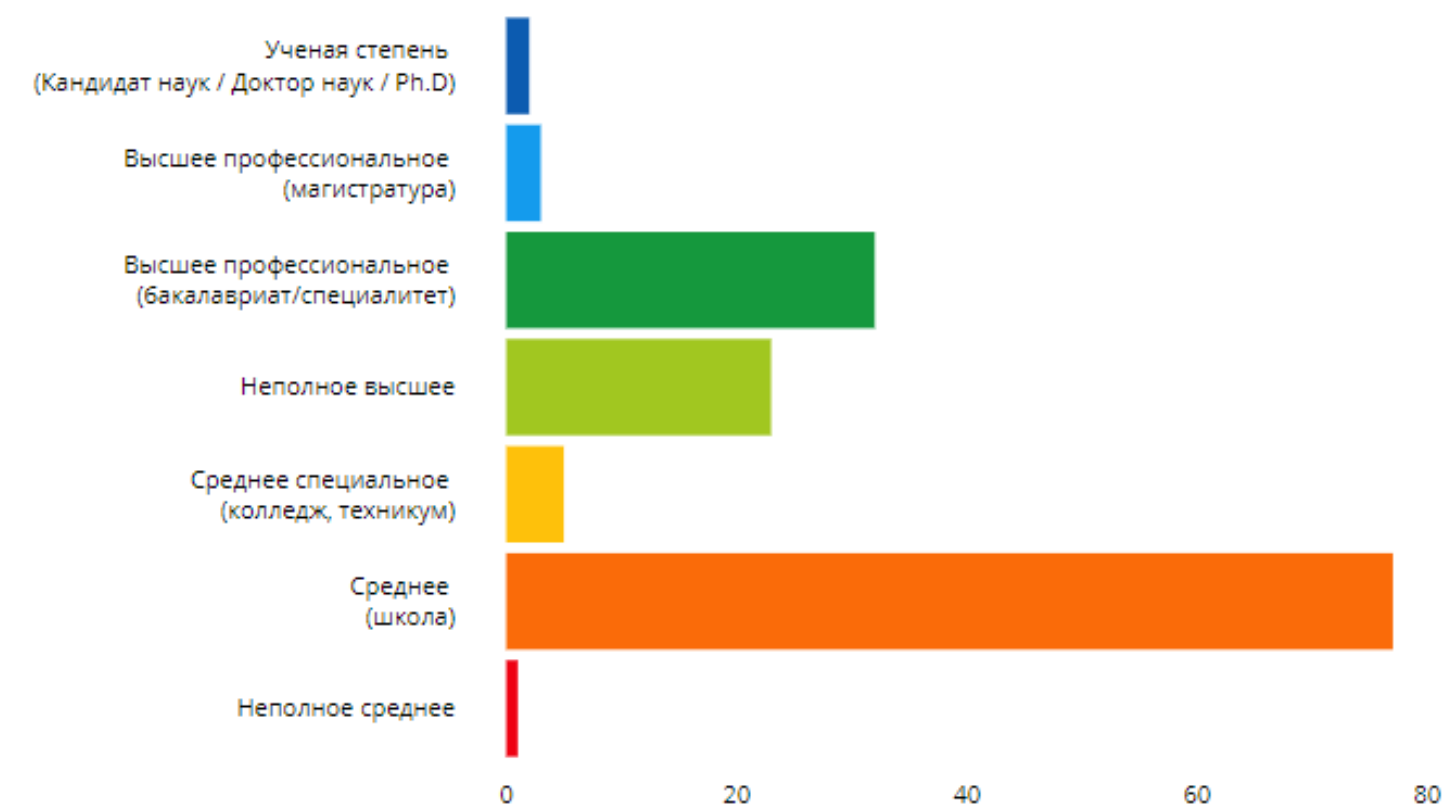
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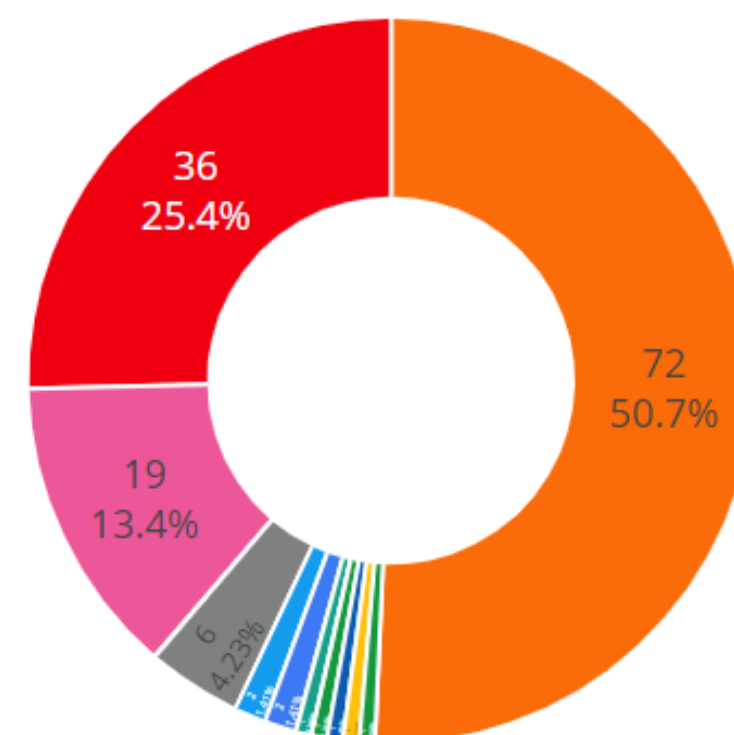


# Инструменты: менеджменту

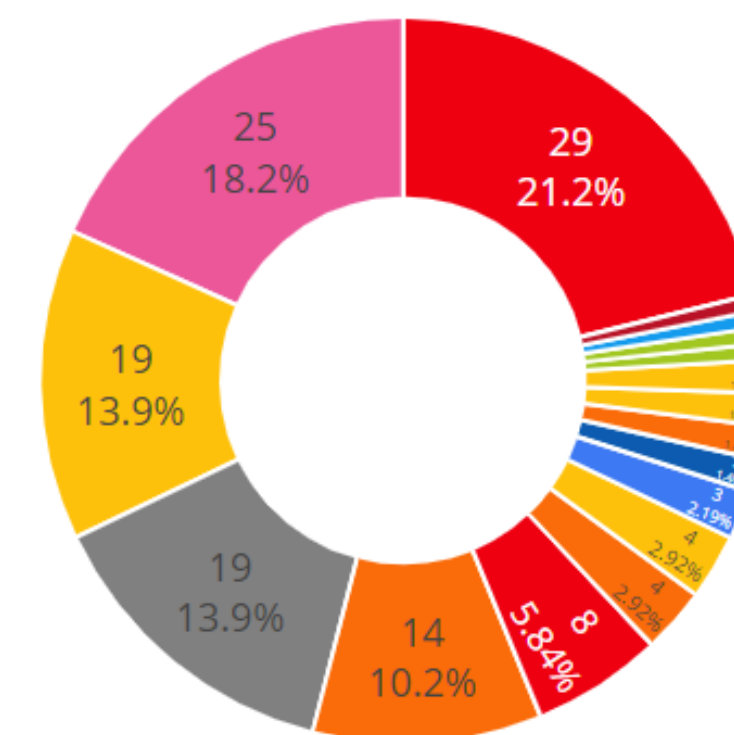
Уровень образования



Сфера образования



Сфера занятости



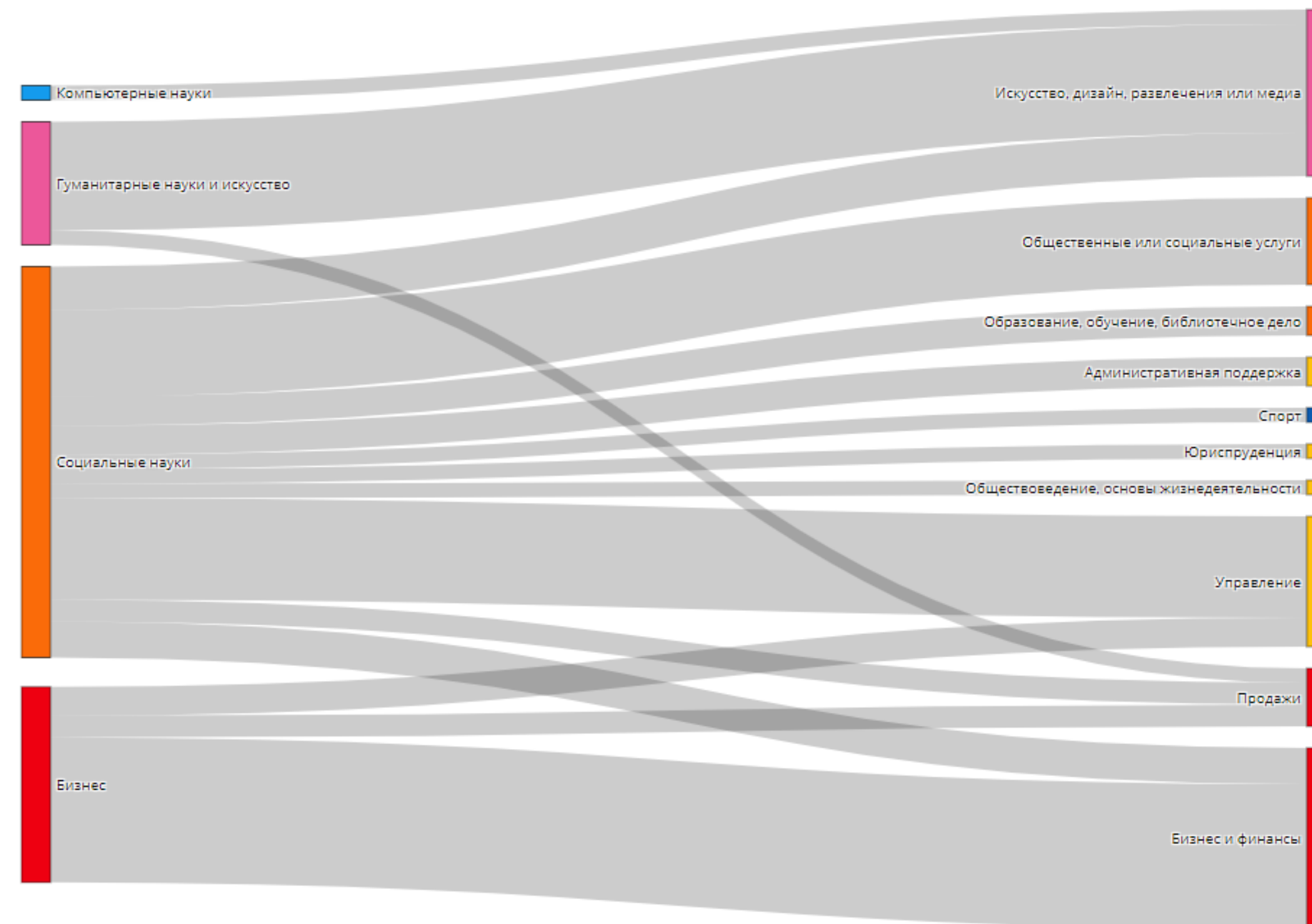


# Инструменты: менеджменту

## Траектория обучения и карьеры

На диаграмме отображены пары ответов на вопросы о сфере образования и сфере желаемой (или текущей) работы. Например, если есть широкая связь между “Компьютерными науками” и “Бизнесом”, то это значит, что многие слушатели получают образование в сфере компьютерных наук, но хотят работать в бизнесе.

На графике отображаются только ответы, которые дали не менее 1% слушателей.







Спасибо.

[dabbakumov@hse.ru](mailto:dabbakumov@hse.ru)