



yeepa® Play – Measure – Learn

Play for Qualification

Self-organized mobile learning and continuous testing in companies, schools and universities on a multiplayer quiz platform combining gaming with learning analytics

Serious Gaming, Game based Learning, Gamification ... these approaches have in common that they combine serious professional objectives with the advantages of highly motivational game-based social interactions. But how could one really practically open up the potential of competitive game scenarios for learning?

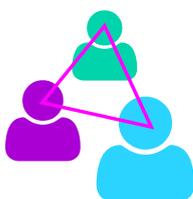
Conventional methods of e-learning are costly and also technically demanding with regards to operation and production. Because of a lack in personalization they are not efficient, whether that the learning contents are too difficult or too easy. And that results unfortunately in demotivation effects. In addition any interspersed or final testing is only very rarely based on psychometrics with validated questions, so that upon the completion of such courses usually neither the participants nor the organizers get valid insights about knowledge gains and further real learning needs.

Taking Advantage of Current Technology Trends



It is high time to consider methods that are more efficient, easier to be implemented and much more closely oriented to effectiveness. The following technology trends, currently much discussed, come as on cue: availability of electronic content in *mobile communication*, real-time social interaction in *social networks*, online games or *gamification* and data analysis in *business intelligence or learning analytics scenarios* and working with *big data* in general offer a fantastic base for modern, motivation-oriented tools in education and training.

Important Note: Learning is a Social Process



Motivation and individual learning progress are important aspects, usually well covered in traditional learning through individual or small-group training and constant feed back by a teacher or peers. Communication and collaboration is here of highest importance. The direct interaction creates identification and authentic experiences that are essential for any achievements. This high degree of engagement needs obviously to take place in an internet-based learning scenario as well.

Learning is Started by Playing



The **yeepa gaming cycle** motivates learning in a unique way: first comes a game (actually a test) and *then* – *after* the playing – the player starts the learning to improve the score next time. Thus, a cycle of three learning actions is maintained:

1. Playing together

Motivation by social interaction and sporty competition.

2. Measuring scores and indicators

Controlling of learning efficacy by validated ability scores.

3. Focussed learning

Reading only the content chunks, which are needed to gain a better gaming score by closing individual knowledge gaps.

Being a game the testing does not generate pressure or embarrassment, but is rather fun and excitement. Not only knowledge but luck and strategic thinking are part of the competitions and tournaments. In this process big data is generated that can be analyzed and control the learning. yeepa works as a real-time game server and provides all technical features online which are needed to support these processes, not only the gaming but also content production and administration of games.

Now, Let's play Together ...

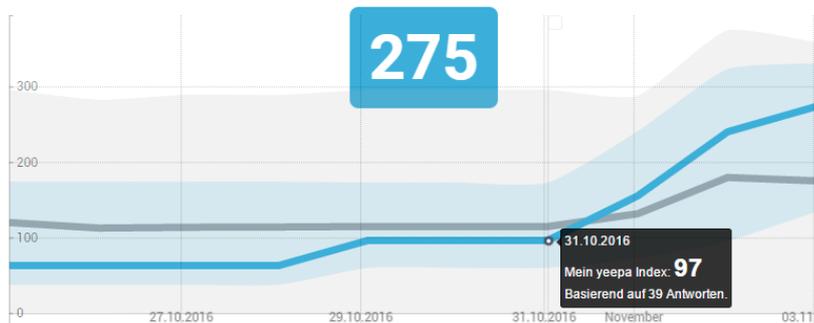
Players log in via smartphone, tablet or laptop and compete against each other in quizzes on rather challenging professional topics. A game may just take a few minutes. But after each game the participants receive an individual training plan for the next game. Clearly they want to improve the game results, so they anxiously check out the learning tips and then rush to the next round. The underlying logic is to actually create permanently new occasions which let gamers deal with knowledge gaps and thus stimulate self-learning. Obviously the more and longer the participants play, the more valid is the data analysis, therefore the better is the guidance based on these data and the more the gamers learn.

... and Measure Together

The Player's dashboard shows his position with regards to his knowledge development and how the team or the community is doing. This is clearly illustrated in the **yeepa® Index**. Similar to a stock index all the information from the psychometric measurements are combined into a representation of only one figure - easily to understand and to follow: where am I, where are the others and what do I need to study in order to close the indicated gaps.

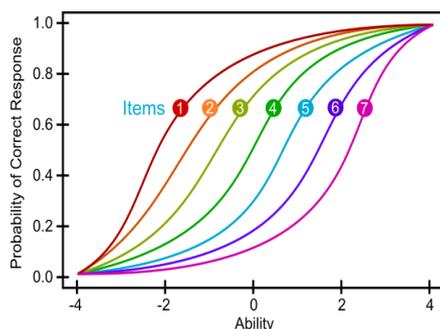
Data Science Integrated: Getting Better Data by Psychometric Statistics

yeepa Index 



The yeepa[®] Index is calculated continuously from game protocols and takes the difficulty of each question into account. It is based on established methods of probability statistics namely psychometrics and the Rasch model (*Item Response Theory*). With these tools the learning analytics allows valid group and interval comparisons. The difficulty of questions is determined as a probability

curve relating player's ability to the item solving behaviour. The more difficult the questions are, the higher the value for the computation of the yeepa[®] Index. The index refers at any given time to the results of the past games in order to calculate the actual and current knowledge. The more game rounds have been played by the player the more accurate is the estimate of the state of the knowledge. The player can view the development over time and compare them with the development of the group.



yeepa[®] visualizes the quality of any tournament questions (aka. items) based on the model of probabilistic test theory according to the Rasch model, a standard in modern test industry, which is used e.g. in the OECD PISA studies.

yeepa[®] Use Cases

1. Human Resources Development

400 Trainees of a Public Health Insurance Organisation, Germany

How to assist learning constantly, efficiently and measurably in a corporate training programme? This was investigated in 2015/16 with 400 trainees preparing themselves voluntarily through yeepa knowledge competitions prior to an internal examination. 110 quiz questions (multiple-choice format) on eight topics relevant in the insurance industry as well as related study material were produced by vocational trainers of the company. The formative evaluation of the games provided important information for the authors about the validity of their questions. Getting the validity right is obviously ultimately the basis for accurate measurements during the Games. After the first six weeks 77,100 answers to the quiz were statistically processed and validated by yeepa. The authors could quickly identify low quality items and replace them on the fly.

2. Medical Education

Cross-Over Study at the University of Mainz, Germany

yeepa has been evaluated in 2015/16 at the Institute of Occupational, Social and Environmental Medicine at the University of Mainz. 400 students prepared themselves für examinations in the field of Health Economics. From these 400 a group of 200 randomly selected students solely studied in teams using the yeepa platform. The outcome of this cross-over study was in favour for the students using the yeepa based training. The University decided therefore to offer yeepa as a learning platform to 1000 students for the following semesters. Most important results of the study:

1. The score and psychometrically established knowledge index are positively correlated with the exam result.
2. There is a slight advantage for the gamers at the exam results.
3. The students create spontaneously learning groups as to be more efficient in the games. One favourite location for these groups used to be the University cafeteria. The students also tried to manipulate the system, looking for easy short-cuts for a better score.
4. There is no technical hurdle for the participants, the hotline remains unclaimed.
5. The items are permanently validated by yeepa: some questions were recognized as too easy for the target group and could be replaced swiftly. Thus the authors were able to optimize the games constantly.

Health Education in Afrika as a scaled up mobile awareness campaign

1600 young adults in Nairobi and Kisumu competed against each other and in teams in mobile multiple choice knowledge tournaments on reproductive health over six weeks in October/November 2017. Results:

- 244.000 medical questions were answered.
- One million possible answers were reflected.
- 500.000 learning tips for better winning chances were studied.
- Analytics software was applied for better coaching of learners and precise impact measurement and quality control

3. Disaster Risk Prevention

Assessing disaster prevention capabilities in Taiwanese Families

In 2018-2019 the University of Taipei (NTPU Department of Finance and Cooperative Management), in collaboration with the Taiwan Typhoon and Flood Research Institute (TTFRI), is conducting a nationwide study to assess risk behaviour in rural areas at risk from weather disasters (cyclones, floods, scree and mud avalanches). The participating regions were determined by hazard situation on the basis of historical weather data and supplemented by less endangered areas for the control groups. There are 26 schools with a total of about 3000 pupils aged 12-14. In 2019 the game dramaturgy is extended by a attribute measuring questionnaire about energy sustainability. 230.000 items are played (250 different questions).

4. Competition Events

German IT Summit

In 2016 and 2017 yeepa was selected to be the "IT-Summit Game" during the prestigious annual IT event organized by the German government with about 1000 invited experts. In preparation to this annual event the *German Society for Informatics* with its affiliate company DLGI launched a student tournament on information security, a highly regarded topic in Germany. 4000 students competed against each other and played 400.000 questions within one week. The three best student groups represented the benchmark at the end of the week, to which the IT experts at the summit had to compete within a single competition. During the entire tournament yeepa calculated on the fly individual knowledge development as well as collective performances. With a dynamic knowledge score gamers could monitor individual and collective achievements at any time. The surprising outcome: students had a better knowledge in IT security! Obviously gained by intensive gaming for one week they had a clear advantage compared to the visitors of the summit.

Assessing the Assessors: Knowledge-Games for HR Professionals

yeepa provides the expo-game for several HRD fairs in Germany to engage fair visitors and customers of IBM in knowledge tournaments about assessment centers and their use in corporations. It is a very demanding and professional game. At 3 p.m. the winners are celebrated at the IBM booth which attracts crowds of participants.

The Company

SNTL Publishing, a Berlin based software development company, implements primarily *open source* based solutions and services for knowledge management in the health industry, in research institutions, in medical education, corporate training and in schools. A number of flagship projects document the capability of the company, be it with the University of Bern (Switzerland), the Universities of Mainz and Jena in Germany, the Helmholtz Association, or with a large scale GIZ project in India.

SNTL Publishing provides yeepa®, the educational mobile and social gaming platform, that comes along with embedded psychometrics for precise knowledge and impact measurement with individuals and collectives. The combination of game and precise measurement of knowledge makes yeepa® a unique analytics instrument in human resources development, continuous testing, market communication and awareness campaigns.

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