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APPLICATION OF THE GAME "COGNIVERSE" AS AN ACTIVE LEARNING STRATEGY IN HEALTH EDUCATION

APLICAÇÃO DO JOGO "COGNIVERSO" COMO ESTRATÉGIA DE APRENDIZAGEM ATIVA NA EDUCAÇÃO EM SAÚDE

APLICACIÓN DEL JUEGO "COGNIVERSE" COMO ESTRATEGIA DE APRENDIZAJE ACTIVO EN LA EDUCACIÓN EN SALUD

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ABSTRACT

In health education, active learning approaches have gained increasing importance for enhancing the quality of learning, clinical reasoning processes, and socio-emotional skills. The "Cogniverse" is a novel, interactive, and low-cost pedagogical tool that promotes multimodal learning through verbal, associative, and nonverbal communication. This study describes and analyzes the implementation of the "Cogniverse" in health education as a strategy to improve active learning, teamwork, and integrative cognitive engagement. Grounded in social constructivism and Bloom's Revised Taxonomy, the method focuses on developing higher-order cognitive and socio-emotional competencies through three consecutive stages—verbal explanation, one-word clue, and nonverbal representation—each targeting distinct dimensions of cognitive representation and meaning. The organized use of this activity fosters semantic activation, concept formation, embodied cognition, and collaborative learning, ultimately enhancing memory retention. The findings indicate that engaging in active, play-based learning stimulates motivation, empathy, and clinical reasoning among students and faculty members. Overall, "The Cogniverse" represents a successful, user-friendly, and humanized active learning technique that promotes interdisciplinary learning, communication skill development, and professional competencies aligned with patient-centered care.

Keywords: Active Learning. Game-Based Learning. Health Professions Education. Clinical Reasoning.

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RESUMO
Na educação em saúde, as abordagens de aprendizagem ativa têm ganhado importância crescente para a melhoria da qualidade do aprendizado, dos processos de raciocínio clínico e das competências socioemocionais. O “Cogniverse” é uma ferramenta pedagógica inovadora, interativa e de baixo custo que promove a aprendizagem multimodal por meio da comunicação verbal, associativa e não verbal. Este estudo descreve e analisa a implementação do “Cogniverse” na educação em saúde como uma estratégia para aprimorar a aprendizagem ativa, o trabalho em equipe e o engajamento cognitivo integrativo. Fundamentado no construtivismo social e na Taxonomia Revisada de Bloom, o método concentra-se no desenvolvimento de competências cognitivas e socioemocionais de ordem superior por meio de três etapas consecutivas — explicação verbal, pista em uma palavra e representação não verbal —, cada uma direcionada a diferentes dimensões da representação cognitiva e da construção de significados. O uso organizado dessa atividade favorece a ativação semântica, a formação de conceitos, a cognição incorporada e a aprendizagem colaborativa, resultando, por fim, na melhoria da retenção da memória. Os achados indicam que a participação em práticas de aprendizagem ativa e lúdica estimula a motivação, a empatia e o raciocínio clínico entre estudantes e docentes. De modo geral, o “Cogniverse” representa uma técnica de aprendizagem ativa bem-sucedida, de fácil aplicação e humanizada, que promove a aprendizagem interdisciplinar, o desenvolvimento de habilidades de comunicação e competências profissionais alinhadas ao cuidado centrado no paciente.

Palavras-chave: Aprendizagem Ativa. Aprendizagem Baseada em Jogos. Educação em Profissões da Saúde. Raciocínio Clínico.

RESUMEN
En la educación en salud, los enfoques de aprendizaje activo han adquirido una importancia creciente para mejorar la calidad del aprendizaje, los procesos de razonamiento clínico y las competencias socioemocionales. El “Cogniverse” es una herramienta pedagógica novedosa, interactiva y de bajo costo que promueve el aprendizaje multimodal mediante la comunicación verbal, asociativa y no verbal. Este estudio describe y analiza la implementación del “Cogniverse” en la educación en salud como una estrategia para fortalecer el aprendizaje activo, el trabajo en equipo y el compromiso cognitivo integrador. Basado en el constructivismo social y en la Taxonomía Revisada de Bloom, el método se centra en el desarrollo de competencias cognitivas y socioemocionales de orden superior a través de tres etapas consecutivas —explicación verbal, pista de una sola palabra y representación no verbal—, cada una orientada a diferentes dimensiones de la representación cognitiva y la construcción de significado. El uso organizado de esta actividad favorece la activación semántica, la formación de conceptos, la cognición corporizada y el aprendizaje colaborativo, lo que finalmente mejora la retención de la memoria. Los hallazgos indican que la participación en prácticas de aprendizaje activo y lúdico estimula la motivación, la empatía y el razonamiento clínico entre estudiantes y docentes. En general, el “Cogniverse” representa una técnica de aprendizaje activo exitosa, de fácil aplicación y humanizada, que promueve el aprendizaje interdisciplinario, el desarrollo de habilidades comunicativas y competencias profesionales alineadas con la atención centrada en el paciente.

Palabras clave: Aprendizaje Activo. Aprendizaje Basado en Juegos. Educación en Profesiones de la Salud. Razonamiento Clínico.

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1 INTRODUCTION

Lecture-based traditional medical or health sciences instructional approaches have recently faced challenges from increasingly interactive, student-centered, and competency-focused approaches1–3. In modern health education, critical thinking, problem solving, communicative and empathizing methodologies have a relevance, pushing beyond passive knowledge transmission4,5. Active learning approaches (e.g., problem-based learning (PBL), team-based learning (TBL), or game-based learning (GBL)) have shown repeatedly to be efficient in promoting meaningful development and reflective practice and knowledge retention6–8.

This approach also encourages students to develop their own, intrinsic (or interdependent) motivation, as the role of construction and interaction within group learning are to construct, negotiate, and apply knowledge (PBL) in a meaningful way9,10. In this framework, playful and experiential modalities have emerged in this range (e.g., serious games or simulation-based learning) that serve as creative forms of connecting the cognitive, affective, and social aspects of learning to11,12 the world (the other end of a spectrum). Thus the “Cogniverse” is a participatory pedagogical strategy based on the concepts of playful learning, cognitive engagement, and social interaction. Its structured sequence of expressive and reflective tasks supports learners in processing, representatising and communicating complex concepts through a range of modalities (verbal, visual, and embodied).

This holistic method strengthens cognitive flexibility as well as emotional intelligence, and it is particularly appropriate in health education settings where communicative, emotional, and integrative reasoning are important13,14. Hence, this article seeks to present a systematic description of the methodological description of the “Cogniverse,” including its theoretical background, implementation method, and use cases within health education. In so doing, it adds evidence to the evidence base which increasingly suggests the potential benefit of new low-cost, innovative, and humane approaches to training future health professionals.

2 MATERIALS AND METHODS

The activity is grounded in Vygotsky's social constructivist perspective (15), where learning is a result of social mediation and shared meaning creating. It's based on Bloom's Revised Taxonomy16, which encourages the transition from understanding to application,

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analysis, and synthesis. Furthermore, the pedagogical relevance of embodied and experiential learning17 reinforces the role of kinesthetic and affective components of cognition, frequently marginalized within medical learning strategies. The "Cogniverse" group challenge: an inexpensive, fun, low-cost interaction-based interactive group game that encourages cognitive integration, communication skills, and empathy. It can also be used in classrooms, for small-group tutorials, or for interprofessional workshops.

Most of the time, the game is played by maybe 6-30 players with groups of 4-6 players and the minimum duration is about 30-50 minutes, depending on number of terms used.

Preparation

The participants first prepare a list of keywords to reference the session learning objectives before starting. The terms might include clinical topics, anatomical structures, diagnostic processes, or psychosocial themes related to health education (e.g., “inflammation,” “radiograph,” “communication,” “homeostasis”). Each of them is printed on a separate card or shown digitally. The facilitator lists the three stages to the activity and explains the rules:

The original keyword or its direct derivatives are not used.

Graciousness and attention while taking turns with peers.

Engaging in group work and joint understanding and collective thought.

Phase 1 – Verbal Explanation. The card, accompanied by a keyword, is given to a participant at the center of the group. Without giving information away, the player verbally explains clearly and descriptively. (The rest of the team listens and attempts to guess the term.) The aim is to enhance verbal reasoning, conceptual expression, and didactic clarity with corresponding communicative functions present in clinical and school environments. In each round (all 3 phases) the facilitator can permit a maximum of 2 minutes. In phases 1, 2, and 3, the scores are based on the number of hits at each round. If the correct answer is provided, the group will proceed to the next step and use the keyword again.

Phase 2 – One-Word Clue. Now that the same participant needs to explain, they must use one word to best represent or symbolize it (equivalent for example of “balance” (homeostasis), or “fire” (inflammation)). The remaining group tries to draw an inferential meaning of the original keyword from this associative cue only. During this phase, students are encouraged to use semantic compression, abstraction, and critical reasoning in the training they conduct, making them learn in an efficient manner how to extract meaning from complex ideas to facilitate a successful clinical decision.

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Phase 3 – Nonverbal Representation. This phase involves the visualization to be done totally nonverbally, completely by gestures, mimics or body movement; there must be no other verbal or written communication present. This phase brings embodied cognition, creativity, and empathy to the fore, which allows the participants to consider other ways of enacting these ideas. It also emphasizes non-verbal communication in patient care, as most gestures, tone, and body language send emotional and relational messages. Each team does a practice with every card and will take turns to perform and guess words until all cards are turned.

The facilitator supports students' rapid reflection at the end of each term or the end of the lesson, encouraging students to explain how each representation related to their understanding of the concept and what they learned in different expression modes.

Debriefing and Reflection

At the end of the session, a guided reflection (debrief) reinforces learning. This act of reflection converts the exercise from a hobby to a structured learning journey, involving the cognitive, emotional, and social aspects. It also assists in the translation of the activity into professional skills like empathy, teamwork, and communication, as suggested in the present health education frameworks.

Materials and Adaptations

The “Cogniverse” can be conducted using relatively inexpensive items (cards and a whiteboard) with no technology requirements, which lends itself to varied educational settings, even low-resource ones. The flexibility of this structure lends itself to review sessions, concept integration exercises or interprofessional education. Variations can involve limited time, or the use of a different point system or thematic rounds based on learning and collective dynamics including those from ethics, anatomy, or diagnostics.

3 RESULTS

The use of a “Cogniverse” model in the realm of Integration in Dentistry achieved very significant positive results regarding students’ cognitive learning and engagement. One activity used in a module, which is interdisciplinary integration between clinical, basic and behavioral sciences, participated during the modules. undergraduate dental students were included for the game, including oral anatomy, microbiology and clinical semiology.

While students worked in small groups facilitating interaction and collaborative knowledge formation. Qualitative feedback from participants who completed the post-activity

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survey indicated they perceived a marked improvement in understanding, retention, and utilization of the theoretical concepts. It was noted that all participants reported that the game helped them to relate theoretical knowledge to clinical practice, and significantly increased motivation and concentration in the classroom during the activity.

Observations by faculty confirmed these findings: students displayed improvements in verbal description of dental concepts, teamwork and communication skills, and demonstrated greater confidence in using theoretical knowledge to help translate oral communication in clinical settings.

The nonverbal and associative phases also focused on promoting empathy, creativity and reflective thinking, core skills found in professional dental education today. On the whole, the “Cogniverse” turned out to be a very powerful learning tool that built on the cognitive, social and emotional side of learning in the dental curriculum.

The “Cogniverse” successfully integrated in the Integration in Dentistry course supports the growing evidence supporting active learning methodologies used in health education.

The findings suggest that this participatory and playful practice not only increases the depth of retention of knowledge but also encourages active participation through multimodal approaches involving verbal, associative and kinesthetic learning.

4 DISCUSSION

These results are consistent with earlier findings in that active and game-based educational methods improve motivation, self-efficacy, and retention of long-term concepts in health professions curricula3,8,18. Within this framework, the “Cogniverse” served as a live educational resource able to blend theoretical and practical aspects, helping to support students to think clinically and to talk about their thinking in interdisciplinary ways.

Furthermore, the activity promoted socio-emotional competencies that are important in the professional field, including empathy, cooperation and active listening, skills that are highly recommended in the dental curriculum19,20.

The game’s non-competitive setting and nature of cooperative learning facilitated supportive learning with students, improved peer interaction, and decreased anxiousness related to oral talks or assessments.

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From a pedagogical perspective, the methodology can also be viewed through the lens of Vygotsky's constructivist framework15, emphasizing pedagogues' social mediation and scaffolding as critical in knowledge learning.

The "Cogniverse" established a zone of proximal development that advanced beyond simple recall and moved from the social engagement to more sophisticated aspects of conceptual integration and application by bringing cognitive challenge, then, together with social collaboration, in a zone of proximal development, students took a step from recall to use and comprehension of what the student was being asked to incorporate and use.

5 CONCLUSION

This paper argues that the "Cogniverse" in the context of Integration in Dentistry is not a new development but rather is an original and humanizing pedagogical tool to bridge theory and clinical reasoning in practice. By linking verbal, symbolic, and nonverbal communication methods this intervention provides a dynamic learning experience that nurtures thoughtful reflection as well as an active learning experience, creating deeper knowledge as well as crucial soft skills for health care practice. It is simple and adaptable, and grounded in theory, which enables it to become replicable and sustainable as a methodology for transformative learning and professional competence in dental and health education courses.

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