



AMERICAN  
UNIVERSITY OF BEIRUT  
FACULTY OF ARTS & SCIENCES

SCIENCE & MATHEMATICS  
EDUCATION CENTER

DEPARTMENT  
OF EDUCATION

THE **TWENTY FIFTH** ANNUAL SCIENCE AND MATHEMATICS  
EDUCATORS CONFERENCE (**SMEC 25**) IN BEIRUT, LEBANON

# INNOVATIVE PRACTICES TO BRIDGE LANGUAGE AND **LEARNING** IN MATHEMATICS AND SCIENCE

## **SMEC 25** **CONFERENCE PROGRAM**

**MARCH 2 - 3, 2024 | BEIRUT, LEBANON**

CONFERENCE CHAIR

**RABIH EL MOUHAYAR**

PROGRAM COMMITTEE

**TAMER AMIN**

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**GHINA RAHI**



# PROGRAM AT A GLANCE

SATURDAY MARCH 2, 2024

|                                                   |                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8:30 - 8:45 AM                                    | <b>OPENING CEREMONY</b>                                                                                                                                                                                                                                                                                                   |
| <b>PLENARY SESSIONS</b><br><br>9:00 AM - 10:00 AM | <b>MATHEMATICS</b><br><br>MODERATOR: <b>RABIH EL MOUHAYAR</b><br><br><b>ATTENDING TO LANGUAGE AND LEARNING MATHEMATICS: A FRAMEWORK FOR ACADEMIC LITERACY IN MATHEMATICS</b><br><br><b>JUDIT MOSCHKOVICH</b><br><br>Education Department University of California, Santa Cruz, US                                         |
| 10:00 AM - 10:15 AM                               | <b>BREAK</b>                                                                                                                                                                                                                                                                                                              |
| 10:15 AM - 11:15 AM                               | <b>SCIENCE</b><br><br>MODERATOR: <b>SAOUMA BOUJAOUDE</b><br><br><b>INTEGRATING SCIENCE AND LANGUAGE FOR ALL STUDENTS, INCLUDING MULTILINGUAL LEARNERS</b><br><br><b>OKHEE LEE</b><br><br>Steinhardt School of Culture, Education, and Human Development, New York University, US                                          |
| <b>PROJECT REPORTS</b><br><br>11:30 AM – 12:00 PM | MODERATOR: <b>RABIH EL MOUHAYAR</b><br><br><b>ASSESSING THE IMPACT OF AN EARLY ENGAGEMENT IN STEM IN AN AUTHENTIC RESEARCH SETTING ON THE BELIEFS, PERSPECTIVES, AND INTENTIONS OF YOUNG FEMALES REGARDING THE ROLE OF WOMEN IN STEM</b><br><br><b>RIHAB NASR</b><br><b>NOURA MOUNIRA BAKKAR</b><br><b>SAWSAN SALLOUH</b> |



**SATURDAY MARCH 2, 2024**

## CONCURRENT INTERACTIVE SESSIONS

### DEVELOPMENTAL WORKSHOPS

11:30 AM - 1:30 PM

| TITLE                                                                                                                    | PRESENTER(S)                                  | MODERATORS        | AUDIENCE                      |
|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------|-------------------------------|
| Concept-Based Inquiry: Fostering Meaningful Understanding of Scientific Concepts in Foreign Language Science Instruction | Huda Muhtasib                                 | Tamer Amin        | Science all levels            |
| الابتكار في تعليم العلوم والرياضيات في صف الروضات                                                                        | Fatima Joumaa<br>Noura Jawad Ali              | Rana Bassaj       | Math and Science Kindergarten |
| Interdisciplinary Unit Plan for Conceptual Understanding                                                                 | Alaa Mohammad Karnib                          | Enja Osman        | Math and Science all levels   |
| Maker Education Practices and Challenges in Lebanon                                                                      | Fatima El Ali                                 | Ghina Rahi        | Math and Science all levels   |
| The Power of Play in Math and Science Classes                                                                            | Joanna Ghalayini<br>Rana Yamout<br>Rima Basha | Yara Molaeb       | Math and Science Elementary   |
| Level up Learning in Math and Science Classes                                                                            | Ali Tohme<br>Fatima Eido<br>Anna Saab         | Hawraa Assaf      | Math and Science Intermediate |
| Fostering Middle School Students' Argumentation Skills within Socioscientific Issues Context                             | Abir Ghassan Muhareb                          | Fatima Abou Akila | Science Intermediate          |
| From Passenger to Pilot: Navigate your Learning Journey                                                                  | Roweida Bawab                                 | Razan Kachmar     | Science all levels            |

### INNOVATIVE IDEA SESSIONS

11:30 AM - 12:45 PM



**SUNDAY, MARCH 3, 2024**

## CONCURRENT INTERACTIVE SESSIONS

### DEVELOPMENTAL WORKSHOPS

10:00 AM - 12:00 PM

| TITLE                                                                                 | PRESENTER(S)      | MODERATORS   | AUDIENCE                    |
|---------------------------------------------------------------------------------------|-------------------|--------------|-----------------------------|
| Unveiling the Wonders of Phenomenon Driven Learning: A Journey through NGSS Standards | Haneen Al Aschkar | Hawraa Assaf | Math and Science Elementary |
| In Science, Teach the Vocabulary Before the Grammar                                   | Barakat Nasser    | Rana Bassaj  | Math and Science all levels |

### INNOVATIVE IDEA SESSIONS

10:00 AM - 11:15 AM

|                                                            |               |            |                    |
|------------------------------------------------------------|---------------|------------|--------------------|
| Usage and building of scientific texts in science teaching | Abeer Yassine | Ghina Rahi | Science Elementary |
|------------------------------------------------------------|---------------|------------|--------------------|

**MODERATOR:**  
**RABIH EL MOUHAYAR**

### ACTION RESEARCH AND RESEARCH RELEVANT TO PRACTICE

|                     |                                                                                                                                                               |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10:00 AM - 10:30 AM | Science Content in Kids' Multimedia: An Analysis of the Educational TV Show "Wild Kratts"<br><b>MOHAMMAD HAMMOUR</b><br><b>MOHAMMAD ESTAITEYEH</b>            |
| 10:30 AM - 11:00 AM | The Impact of an Ethnomathematics Intervention on Sixth Graders' Perceptions about the Nature of Mathematics: A Case Study in Kuwait<br><b>HEBA KHANAFAER</b> |
| 11:00 AM - 11:30 AM | Apports de la Réalité Augmentée à L'enseignement Expérimental Du Système Nerveux dans les Lycées Libanais<br><b>SAMAR HASSAN ALMOKDAD</b>                     |
| 11:30 AM - 12:00 PM | From Data to Dialogue: The Transformative Role of Research Summaries and Presentations in Science Learning<br><b>LAMA DABAJA</b>                              |



# ABSTRACTS

## PLENARY 1

SATURDAY | 9:00 - 10:00 AM

### > ATTENDING TO LANGUAGE AND LEARNING MATHEMATICS: A FRAMEWORK FOR ACADEMIC LITERACY IN MATHEMATICS

JUDIT MOSCHKOVICH,  
UNIVERSITY OF CALIFORNIA, Santa Cruz, US

The presentation summarizes a framework for academic literacy in mathematics (Moschkovich, 2015). This framework is useful for analyzing student contributions (oral or written) and reviewing, designing, or supplementing mathematical tasks/lessons that pay attention to language. The presentation includes a classroom vignette and recommendations for instruction that attends to language. Although the example is from a bilingual classroom, the framework and the recommendations are relevant to all mathematics learners, including those in multilingual classroom settings or monolingual students learning to communicate mathematically.

## PLENARY 2

SATURDAY | 10:15 - 11:15 AM

### > INTEGRATING SCIENCE AND LANGUAGE FOR ALL STUDENTS, INCLUDING MULTILINGUAL LEARNERS

OKHEE LEE,  
NEW YORK UNIVERSITY, US

In science education in the United States, A Framework for K-12 Science Education (National Research Council, 2012) and the Next Generation Science Standards (NGSS, 2013) offer a vision of rigorous standards for all students across K-12 classrooms. As science and engineering practices (e.g., develop models, argue from evidence, construct explanations) are language intensive, engagement in these practices presents both learning opportunities and demands to all students, especially multilingual learners. In recent years, there have been fundamental shifts in thinking about both science and language learning. Science instructional shifts, based on the vision of the Framework and the NGSS, and language instructional shifts, based on contemporary thinking in second language acquisition, are mutually supportive in promoting both science and language learning. The presentation highlights how science and language instructional shifts, Framework, are mutually supportive in promoting both science and language learning. Using classroom examples, this presentation will address contemporary approaches to integrating science and language learning in mutually supportive ways for all students, including multilingual learners.

## DEVELOPMENTAL WORKSHOPS

SATURDAY | 11:30 AM - 1:30 PM

### > CONCEPT-BASED INQUIRY: FOSTERING MEANINGFUL UNDERSTANDING OF SCIENTIFIC CONCEPTS IN FOREIGN LANGUAGE SCIENCE INSTRUCTION

HUDA MUHTASIB,  
LEBANESE INTERNATIONAL UNIVERSITY, LEBANON

Concept-based inquiry is a powerful approach to teaching science that fosters deep comprehension of scientific concepts, even when instruction occurs in a foreign language. This method revolves around promoting deep comprehension and application of scientific concepts rather than mere memorization of facts. By emphasizing fundamental concepts over language proficiency, this method enables students to grasp scientific principles by connecting them to real-world phenomena, promoting critical thinking and problem-solving skills. Concept-based inquiry not only enhances scientific literacy but also cultivates transferable skills such as problem-solving, analytical thinking, and communication. Students actively construct their understanding, fostering a deeper connection with the subject matter, even in a language-learning environment. Utilizing this approach involves engaging students in hands-on, experiential learning, encouraging exploration, experimentation, and critical thinking. Visual aids, models, and demonstrations become essential tools to communicate complex ideas effectively. Moreover, educators scaffold language acquisition by integrating scientific terminology into daily lessons, aiding students in developing both language and scientific proficiency simultaneously. This proposal studies the strategies and benefits of employing concept-based inquiry in science education within multilingual settings, highlighting its potential to cultivate a profound understanding of scientific principles regardless of language barriers. By prioritizing fundamental scientific principles, educators can focus on universal concepts, allowing students to grasp the essence of scientific ideas regardless of language proficiency. Concepts like gravity, energy transfer, or cell structure serve as building blocks, transcending language and enabling students to connect new knowledge to prior understandings.





## < الابتكار في تعليم العلوم والرياضيات في صف الروضات

فاطمة جمعة ونور جواد علي

ثانوية الكوثر لبنان

من خلال ورشة العمل التي تحمل عنوان " ابتكار في تعليم العلوم والرياضيات في صف الروضات، لماذا وكيف؟"، سيتم تسليط الضوء على أهمية وكيفية تعليم العلوم والرياضيات في صف الروضات بأساليب مبتكرة. سيتخلل الورشة عرضاً نظرياً حول الموضوع يليه مناقشة تفاعلية حول ما تم عرضه وربطه بتجارب أو أمثلة عملية من قبل الحاضرين. بعدها يتم عرض فيديو لعدة دروس مبتكرة في العلوم والرياضيات يلي كل درس مناقشة لعدة أسئلة متعلقة بالهدف من المفهوم المعروض في الفيديو (الهدف منه، الاستراتيجية الوسائل القيمة المضافة) يلي ذلك عرض صور ألعاب تربوية تقليدية حول مفاهيم رياضيات وعلوم يقوم بعدها الحاضرين باقتراح تعديل على الألعاب لتحويلها الى ألعاب مبتكرة. وفي الختام، ومن خلال عمل مجموعات، تبتكر كل مجموعة لعبة علوم ولعبة رياضيات وتقوم بعرضها أمام الآخرين (اسمها، هدفها، وكيفية استخدامها).

### > INTERDISCIPLINARY UNIT PLAN FOR CONCEPTUAL UNDERSTANDING

ALAA MOHAMMAD KARNIB,

WELLSPRING LEARNING COMMUNITY/ SAINT JOSEPH UNIVERSITY, LEBANON

Lebanon ranks below the global average among 137 countries in terms of the quality of math and science education. Lebanese students' scores were 105 points lower than the average of OECD countries in the PISA exam which assesses 15-year-olds' ability to use their reading, mathematics, and science knowledge and skills to meet real-life challenges. While learning should be associated with conceptual understanding, students have limited chances to conceptualize the concepts or make sense of the topics taught. The traditional curriculum focuses solely on facts and skills, unlike the Concept-based curriculum which is a three-dimensional model incorporating concepts as its third dimension. Teaching by concept emphasizes the students' inquiry and constructivist learning to generate personal meaning-making. Given that educators now have access to a variety of resources and innovative technological tools, including STEM activities, it becomes imperative for them to adopt an inquiry-driven interdisciplinary unit approach in teaching. The interdisciplinary unit approach is vital for cultivating the skills of the twenty-first-century classroom and nurturing conceptual understanding. The developmental workshop, titled "Interdisciplinary Unit Plan for Conceptual Understanding" concentrates on helping students gain conceptual understanding through interactive interdisciplinary minds-on activities. The workshop is divided into three sections, allowing participants to define the concept and teaching by concept, interact with three interdisciplinary activities for teaching by concept, and help them develop plans to prompt learners to gain conceptual understanding and, consequently, meaningful learning.

## INNOVATIVE IDEA SESSIONS

SATURDAY | 11:30 AM - 12:45 PM

### > AN OVERVIEW ON MAKER EDUCATION PRACTICES AND CHALLENGES IN LEBANON

MOHAMMAD HARB AND FATIMA EL ALI,

AMERICAN UNIVERSITY OF BEIRUT, LEBANON

The maker movement, known for its do-it-yourself mindset, is seen as an innovative approach to education. Embracing diverse activities such as crafts, robotics, and digital fabrication, it unifies individuals with a shared vision of solving problems and sharing innovative creations within the community. Advocates argue for its implementation in formal education due to several benefits, including fostering 21st century skills, promoting Science, Technology, Engineering, and Mathematics (STEM) learning, and instilling a maker mindset. In addition to these advantages, maker education empowers learners to become future active citizens capable of driving positive social change. Makerspaces, like "The Red Room" at the American University of Beirut, offer hands-on learning opportunities to foster creativity, innovation, and practical skills among students. This work aims to provide an overview on maker education within the Lebanese content. It will be structured around six key elements that characterize maker education: engaging in maker activities, acquiring skills and competencies, gaining knowledge, developing the 4Cs skills (communication, collaboration, critical thinking, and creative thinking), modeling the design process, and adopting a maker mindset. Additionally, an example of the implementation of maker education within a Lebanese school will be provided. This will shed light on current maker education practices and challenges in Lebanon, providing a foundation for recommendations aimed at enhancing the implementation of maker education in the future.



## > THE POWER OF PLAY IN MATH AND SCIENCE CLASSES

JOANNA GHALAYINI, RANA YAMOUT, AND RIMA BASHA,  
SAINT MARY'S ORTHODOX COLLEGE, LEBANON

Game-based Learning and Gamification offer exciting possibilities for educators to transform classrooms into dynamic, engaging spaces where learning becomes an adventure. These learning techniques make use of simulated and real-life environments to create unique learning experiences for elementary learners. GBL and Gamification learning techniques help learners experience, explore, and navigate Mathematics and Science concepts at the Elementary Level. This workshop introduces innovative learning approaches that focus on the tools educators need to ensure the best learning outcomes for learners. It provides them with a set of techniques and guided activities to implement these learning strategies for teaching and learning in Science and Mathematics classes. It also supports learners' preparation for the future addressing the 21st century skills.

## > LEVEL UP LEARNING IN MATH AND SCIENCE CLASSES

ALI TOHME, FATIMA EIDO, AND ANNA SAAB,  
SAINT MARY'S ORTHODOX COLLEGE, LEBANON

By embracing game-based learning and gamification, intermediate level math and science can become more engaging, meaningful, and impactful. This workshop offers a blueprint for a transformative approach that harnesses the power of play to ignite student curiosity, enhance learning, and prepare students for success in the 21st century. GBL and Gamification learning techniques help learners to experience, explore, and navigate Mathematics and Science concepts at the intermediate level. This workshop presents cutting-edge teaching strategies that highlight the resources teachers need to guarantee the highest possible learning results for students. It gives them a collection of methods and directed exercises to apply these learning strategies for science and math classroom instruction. Additionally, it helps students prepare for the future by teaching them 21st-century skills.

## > FOSTERING MIDDLE SCHOOL STUDENTS' ARGUMENTATION SKILLS WITHIN SOCIOSCIENTIFIC ISSUES CONTEXT

ABIR GHASSAN MUHAREB,  
LEBANESE INTERNATIONAL SCHOOL, LEBANON

It has been recently argued in the literature of science education about preparing scientifically literate students. In response, many educational reforms take enhancing the component of scientific literacy into consideration during the process of planning and developing science curricula. Accordingly, science educators are now tasked not only to promote their students' scientific knowledge but to also encourage them to be aware of socioscientific challenges that take place within local and global communities. Engaging students to think critically about methods to solve these issues would aid in fostering their scientific reasoning, problem-solving, and decision-making skills. In alignment with these lines, many researchers in the field of science education have suggested a transformative approach that would enhance students' scientific literacy by turning our science classes into real communities that tackle real-life socioscientific issues and teach students how to argue for their position. It is unfortunately stated in many studies from literature that students show weak argumentation skills. Therefore, and based on various studies, this proposal suggests explicitly teaching middle school students argumentation skills within various socioscientific scenarios especially that addressing socioscientific issues is known to be controversial and can be seen from different perspectives. Also, helping students to generalize these argumentation skills in other different contexts outside their science classes is a fundamental goal.

## > FROM PASSENGER TO PILOT: NAVIGATE YOUR LEARNING JOURNEY

ROWEIDA BAWAB,  
SWISS INTERNATIONAL SCHOOL, QATAR

Ready to ditch the autopilot and take control of your professional development journey, science teachers? This interactive workshop is your launchpad to becoming the captain of your learning adventure! Forget rigid schedules and one-size-fits-all training – we'll equip you with cutting-edge self-paced strategies tailored to your unique needs and passions. Chart your personalized course: Identify your learning goals, assess your starting point, and create a roadmap for professional development that fuels your ambitions. Fuel your engines: Discover powerful techniques for time management, motivation, and overcoming procrastination, ensuring you stay on track for takeoff. Master the tools: Explore a variety of online and offline resources, leveraging technology to personalize your learning experience and equip yourself with the latest knowledge. Navigate turbulence: Learn strategies for overcoming challenges, adapting to change, and staying resilient on your self-paced journey, ensuring smooth sailing even through unexpected obstacles. Take flight: Share your experiences, collaborate with colleagues, and build a support network, propelling your learning journey to new heights through collective knowledge and camaraderie. This workshop is your ticket to a fulfilling and effective professional development journey. Embrace the autonomy of self-paced learning, unleash your inner pilot, and soar to new heights of knowledge and skill in the exciting world of science education!



## PROJECT REPORT SESSIONS

SATURDAY | 11:30 AM - 12:00 PM

### > ASSESSING THE IMPACT OF AN EARLY ENGAGEMENT IN STEM IN AN AUTHENTIC RESEARCH SETTING ON THE BELIEFS, PERSPECTIVES, AND INTENTIONS OF YOUNG FEMALES REGARDING THE ROLE OF WOMEN IN STEM

RIHAB NASR, NOURA MOUNIRA BAKKAR, SAWSAN SALLOUH

AMERICAN UNIVERSITY OF BEIRUT, LEBANON

Females are often underrepresented in the fields of Science, Technology, Engineering, and Mathematics (STEM), particularly in research and leadership positions. The situation is even worse in low-to-middle-income countries where an economic burden presents an additional barrier towards the pursuit of STEM careers. To promote the representation of women in STEM, educational programs have been designed abroad to provide females with STEM knowledge and experiences. The implementation of such programs in our region is scarce and limited by challenges related to the prevailing economic crisis. "FREE STEM For Females" (FSFF) is an extracurricular educational program designed and implemented in Lebanon by AMALOUNA, an NGO affiliated with AUB, to increase access of underprivileged females to higher education, particularly in STEM. We assessed the impact of early exposure to STEM research in an authentic setting on the beliefs, perceptions, and plans of young females regarding the pursuit of STEM. Female participants filled out pre- and post-program questionnaires.

McNemar(Bowker) and Wilcoxon-Signed Rank tests were used to compare categorical nominal and ordinal (likelihood scale) variables/responses, respectively, before and after the program using SPSS. The results indicate that the program enhanced the females' confidence in their STEM knowledge and application capacities. FSFF increased their understanding of the scientific process and the skills required to succeed in STEM. It promoted their awareness of STEM career prospects and provided them with role models in STEM fields. This indicates the value of early exposure to STEM/research in promoting females' knowledge and skills in STEM fields.

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## DEVELOPMENTAL WORKSHOPS

SUNDAY | 10:00 AM - 12:00 PM

### > UNVEILING THE WONDERS OF PHENOMENON-DRIVEN LEARNING: A JOURNEY THROUGH NGSS STANDARDS

HANEEN AL ASCHKAR,

SHOUF NATIONAL COLLEGE, LEBANON

An enlightening online presentation on Phenomenon-Driven Learning invites the audience on a journey through the world of this engaging educational approach. through an enlightening online presentation rooted in the principles of the Next Generation Science Standards (NGSS) Foundation Course for Tri- Association Schools. This immersive experience invites educators to discover the profound impact of integrating real-world phenomena as the catalyst for inquiry and critical thinking in science classrooms. The session intricately explores the process of constructing models and explanations, guiding participants through the complete inquiry cycle while emphasizing the distinction between the scientific method and authentic scientific practices. Leveraging a carefully crafted PowerPoint presentation, attendees engage with stimulating questions, thought-provoking videos, and reflective exercises, gaining practical insights that seamlessly integrate PDL into their teaching practices. Equipping educators with essential tools, this session empowers them to create dynamic and engaging science learning experiences. By actively participating in the selection and discovery of phenomena and cultivating an appreciation for the genuine intricacies of scientific work, participants achieve insightful comprehension of the nuanced aspects inherent in such pursuits. The theoretical foundation of Phenomenon-Driven Learning comes alive by incorporating elements from the NGSS Foundation Course, effectively bridging the gap between principles and practical application. Immersing themselves in this exploration of Phenomenon-Driven Learning, educators embrace a transformative change of perspective, poised to inspire the next generation of scientists and analytical minds. Embark on this captivating journey, where the potency of PDL converges with the potential of online learning, promising to revolutionize the landscape of science education.





## > IN SCIENCE, TEACH VOCABULARY BEFORE GRAMMAR

BARAKAT NASSER,

BEIRUT ANNUNCIATION COLLEGE, LEBANON

PISA exams result of Lebanese students reveal a huge gap in our curriculum. Studying these results, it has been noticed that most of our students' problems were in understanding what the question demands. However, their results in English were fine. So where is the problem? Crossing results, I noticed that our students lack the ability to link what they are asked to do with what they learned in science. Particularly, in Mathematics and Physics, when questions are not straightforward and do not include "keywords", students struggle to answer them. Teaching science using a second language is a dual problem, students need to focus on the language, and then they need to understand the scientific topic. Translanguaging is the ability to move fluidly between languages and a pedagogical approach to teaching in which teachers support this ability. The Lebanese society is excellent in Translanguaging; however, we mostly consider this to be a language skill. This led to this discussion, how much do we focus on our students' understanding of the vocabulary and definitions of what they learn?

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## INNOVATIVE IDEA SESSIONS

SUNDAY | 10:00 AM - 11:15 AM

### > USAGE AND BUILDING OF SCIENTIFIC TEXTS IN SCIENCE TEACHING

ABEER YASSINE,

AMAL EDUCATIONAL INSTITUTIONS/HASSAN KASSIR HIGH SCHOOL, LEBANON

Most of the time, students find it difficult to understand scientific concepts due to the lack of scientific language, which is why they tend to run away from reading scientific texts or information. So, why not bring reading science to class? This session is designed to enlighten teachers about how and when to use scientific texts during the process of teaching. In addition, it will help them build up and create scientific texts to use in the classroom, or as assessments, according to students' needs and learning objectives. Along with that, the session will shed light on important communication skills that help students enhance and strengthen their possession of the scientific language. All these practices are going to be presented in the form of small activities, or examples, that will engage the participants in the process. As a presenter of the session, I will tend to show how each activity can be applied in a lesson plan, following one of the teaching strategies: 5E-Learning approach, flipped classroom, inquiry approach...etc. As a conclusion, teachers should be able to construct their scientific texts to use in the teaching process, following teaching strategies and approaches. At the same time, teachers should take into consideration students' level and abilities and encourage them to read more to empower their scientific language.

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## ACTION RESEARCH AND RESEARCH RELEVANT TO PRACTICE

SUNDAY | 10:00 AM - 12:00 PM

### > SCIENCE CONTENT IN KIDS' MULTIMEDIA: AN ANALYSIS OF THE EDUCATIONAL TV SHOW: "WILD KRATTS" | 10:00 AM - 10:30 AM

MOHAMMAD HAMMOUR AND MOHAMMAD ESTAITEYEH,

ARAB INTERNATIONAL ACADEMY, QATAR / BROCK UNIVERSITY, CANADA

The past decades have witnessed a significant increase in multimedia directed at kids. Science teachers, especially in elementary classes, often use multimedia in their classes to engage students and explain concepts. This research aims at developing a comprehensive framework that can be used in analyzing educational multimedia content and presenting the findings of an analysis performed on 10 episodes of the award-winning science educational TV show "Wild Kratts". The study was conducted in two phases: developing the analytical framework and conducting the analysis. The framework included the following seven constructs: 1) video structure, 2) scientific and conceptual understanding, 3) explanation of science concepts, 4) age appropriateness, 5) behavior modeling, 6) content quality, and 7) design elements. In the analysis phase, the authors adopt a qualitative, deductive content analysis approach to analyze the episodes. By presenting the framework and the findings of the analysis, this research advances knowledge about using quality multimedia for science teaching and sheds light on important criteria that teachers need to consider upon utilizing these materials in their classes. Additionally, this research informs instructional designers and content creators of what to incorporate in digital educational resources to attain student engagement and achieve learning outcomes.



**> THE IMPACT OF ETHNOMATHEMATICS INTERVENTION ON SIXTH GRADERS' PERCEPTIONS ABOUT THE NATURE OF MATHEMATICS: A CASE STUDY IN KUWAIT | 10:30 AM - 11:00 AM**

**HEBA KHANAFER,**

LEBANESE AMERICAN UNIVERSITY, AMERICAN CREATIVITY ACADEMY, KUWAIT

The purpose of this study was to explore the impact of teaching an ethnomathematical geometry unit on sixth graders' perceptions of the nature of mathematics in a private school in Kuwait. The focus of the study was on students' perceptions about the nature of mathematics in terms of its connectedness to culture and real life in addition to the role of mathematics education in promoting social and political values. Ethnomathematics, as defined by D'Ambrosio, is the mathematics practiced by different cultures; it reflects their practices, ways of living, and social values. Ethnomathematical interventions done in many classrooms showed positive results on students' experience in learning mathematics whether on their motivation, achievement, or perceptions towards mathematics. This study employed a qualitative case study that drew upon classroom observations, interviews, and students' activity sheets. Twenty-two grade six students participated in the study. Twelve students were interviewed according to their achievement levels. Data from transcribed observations and interviews and data from activity sheets were analyzed through thematic analysis. Data from different sources were triangulated and compared to increase the reliability of the study results. Findings revealed that teaching an ethnomathematical unit had a great impact on students' perceptions of the nature of mathematics. Eight essential themes were derived from data analysis which are the following: mathematics as culturally and historically produced; mathematics connected to real life; mathematics connected to values; mathematics connected to other subjects; Eurocentrism and cultural superiority; students' interest, motivation, and collaboration; students' pride in their culture; and girls' empowerment.

**> APPORTS DE LA REALITE AUGMENTEE A L'EINSEIGNEMENT EXPERIMENTAL DU SYSTEME NERVAUX DANS LES LYCEES LIBANAIS | 11:00 AM – 11:30 AM**

**SAMAR HASSAN ALMOKDAD,**

AL-KAWTHAR SCHOOL, LEBANON

La dissection est une pratique qui a longtemps été utilisée dans l'apprentissage dans de nombreux domaines, mais elle est désormais confrontée à de nouvelles réglementations et restrictions. En parallèle, nous assistons aujourd'hui à une révolution de la technologie et de l'intelligence artificielle qui jouent un rôle croissant dans tous les secteurs, y compris l'éducation. Pour profiter de la technologie et pour faire face aux dangers de la dissection nous avons envisagé la création d'une application de réalité augmentée destinée à l'enseignement du système nerveux. Cette recherche a pour but de montrer la conception, la description et l'évaluation de cette application en réalité augmentée. La création de cette application en réalité augmentée s'est réalisée suite à une coopération entre le chercheur et deux concepteurs de jeux. Et pour évaluer cette application, nous avons sollicité l'avis d'experts, d'enseignants et d'apprenants au moyen de questionnaires basés sur des théories pertinentes. En raison de contraintes pratiques, nous avons opté pour une sélection des participants par commodité plutôt que de recourir à un échantillonnage aléatoire. Du côté des résultats, l'analyse de ces derniers, effectuée à l'aide du logiciel SPSS 21, ont montré que les experts, les enseignants et les apprenants voient l'application "Mouse Dissection AR" comme innovations positives. Ils la perçoivent comme étant à la fois intéressante, rapide et facile à utiliser. Cette application pourrait bénéficier aux lycéens et pourrait avoir une utilité potentielle à l'université. Cette application est disponible sur le Play Store et elle est gratuite. Le lien de l'application est le suivant <https://play.google.com/store/apps/details?id=com.HDZD.MouseDissection>

**> FROM DATA TO DIALOGUE: THE TRANSFORMATIVE ROLE OF RESEARCH SUMMARIES AND PRESENTATIONS IN SCIENCE LEARNING | 11:30 AM – 12:00 PM**

**LAMA DABAJA,**

SAINT GEORGE SCHOOLS, LEBANON

"From Data to Dialogue: The Transformative Role of Research Summaries and Presentations in Science Learning" introduces an innovative strategy to address the challenges of teaching science in a second language. The Research Summaries and Presentations (RSP) approach, involving exposure to authentic scientific articles, summarization, and collaborative presentations, emerges as a comprehensive solution to enhance language skills and scientific understanding. The presentation begins with an exploration of language barriers in science education, tracing the evolution of the RSP strategy based on positive research outcomes. Practical insights into its implementation, including educator workshops and hands-on student practice, highlight its efficacy in fostering student engagement and autonomy. The presentation concludes by inviting readers to explore the potential of the RSP strategy in revolutionizing science education through dialogue, collaboration, and a proactive learning approach.

