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Celebrating Student Research and Academic Projects at SASH

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BRISTOL, R.I. – At the eighth annual Student Academic Showcase and Honors (SASH) on Wednesday, undergraduate and graduate students shared their academic accomplishments with the RWU community. Students presented academic research, Honors Capstone Projects, panel discussions, arts performances, and other scholarly and creative endeavors.

"One of the most exciting things to happen at a university is the creation of new knowledge," said RWU President Ioannis Miaoulis. "SASH is a day celebrating scholarship for the University. It gives an opportunity for students and faculty to go around and see all the creative work from this year."

For the first time, RWU canceled regular class meetings during SASH to prioritize community participation. Students attended presentations, discussed research, and asked questions of their peers.

"It’s fantastic to see such an incredible variety of projects," said Provost Margaret Everett. "It gives me a lot of pride to see what the students have been able to do this year, and to hear them talk about their passions."

Here is a sampling of the many creative academic projects shared at SASH 2021:
Calibrating an Algal Alert Sensor

Sarina Olson, Junior Electrical and Computer Engineering major from Bristol, R.I., presented her work on improving the design of a submersible fluorometer, a device used to detect dangerous algal blooms. Olson's results found the device to be able to differentiate between two algal groups using light.

Evaluating A Public Health Program

The Bristol Health Equity Zone, a Rhode Island Department of Health initiative to promote local health, made its in-person cooking demonstrations virtual due to the COVID-19 pandemic. Samara Pinto, senior Psychology major from Maynard, Mass., evaluated the virtual cooking program to determine its effectiveness.

She began interning with the Bristol Health Equity Zone in the winter of 2021, and plans to continue her involvement throughout the summer.

"My long-term goal is to work for the Department of Health in Rhode Island, so this was a really neat way to learn about my own community and its needs," said Pinto.
Senior Computer Science majors Nicholas Ferreira, Peter Navarro and Michael Pieper created Varro, an app that expands the function of digital communication. Varro provides more options for interactive video calling, a need the team recognized from the reliance on virtual connection through the COVID-19 pandemic.

"Viewers can focus on a part of the screen, zoom in, or tell the presenter to speak up non-verbally. The key purpose is to make digital presentations and communication more fluid, less clunky, and more personable," Ferreira said.
"In the software development world, you are always working in a team, coding for two weeks, meeting, seeing how everything runs, and going from there. Spending a full year on a project with the same group of people is what we would do in the workforce. Instead of just being given directives and having to follow them to the T, we had to decide how we would create what we did, so I think this is a very applicable project," said Pieper.

Senior Computer Science majors Nicholas Ferreira, Peter Navarro and Michael Pieper with their poster "Varro: A System that Allows a Remote Viewer to Direct Where a Presenter 'Aims' Their Phone Camera."

Architecture For Community Development
Justine Aho, senior Architecture major from Pelham, N.H., presented her Honors Capstone Project, “Center of Culture, Creation, and Expression,” a semester-long architectural design studio project in which she designed an arts center in Boston, Mass.

"Going forward, I really want to focus on large projects like this that benefit the public sphere," said Aho. "I want to focus on the diverse groups of people who live in or visit a city, and I think this project really did that. Art is so important, regardless of your background. Whether you are an Architecture major like me, an Engineering major, an Arts major, no matter what you are learning, art is important for developing your cities and creating a sense of
community. This art center encourages people to engage with art and the benefits it provides."

Justine Aho, senior Architecture major, designed this arts center for her Honors Capstone Project, "Center of Culture, Creation, and Expression."

Child Development Through Athletics

Senior Educational Studies major Sebastian Suarez, from West Hartford, Conn., is on the path to becoming an Athletic Director. He researched the benefits of exercise for middle-school aged children and designed an athletic program to keep them moving.

"I was wondering what happens to students in the lower grades, who are in such a crucial developmental stage, when they have to do remote education. A lot of them are just in front of their
computer screens all day, not really doing anything else," said Suarez. "Exercising helps them wake up their brain and help them focus on their task at hand."

He designed five 15-minute workout videos to be shared through Google Classroom to meet exercise requirements and improve student motivation.

"Down the line, I hope to implement this program in the school I work for," said Suarez.

Suarez will attend Rider University's Masters in Athletic Leadership program after graduating.

Senior Educational Studies major Sebastian Suarez, from West Hartford, Conn., with his project "Exercising In a Covid-19 World."

A Pizza Delivery Robot
Senior Engineering Majors Tim Beaulieu, Joe Gaudio, Joseph Hogan, Eamon McKenney and Logan Souza developed a "Pizza Delivery Robot," a machine capable of securely driving a full pizza across campus, for their Senior Design project. They set up their robot on the Library Quad to provide demonstrations for curious spectators.

Reducing Cybercrime Targeting College Students

Senior Criminal Justice major Natalia Villareal, from Feeding Hills, Mass., wanted to help her peers reduce their risk of cybercrime victimization through education.

For her Honors Capstone Project, Villareal researched the online habits of college students, and studied the effects of preventative measures on reducing crime risk, along with the impact of cybercrime on her community.
"I really was able to begin to understand the vulnerabilities of the college population in terms of cybercrime victimization," said Villareal. "I was able to understand the ways they expose themselves on a daily basis and the ways this contributes to them feeling unsafe online. I really want to draw attention to the fact that people might not even realize the ways they are exposing themselves. They might not understand that their data is vulnerable. It is my hope that bringing awareness to this type of thing will help mitigate this risk."

Senior Criminal Justice major Natalia Villareal, from Feeding Hills, Mass., presents her Honors Capstone Project "Fear of Cybercrime and Victimization."

Advising Young Investors
Senior Finance and Economics major Emily Gildea, from Palos Park, Ill., presented her Honors Capstone Project "Educating Retail Investors in a Volatile Market."

While working last summer in RWU's Center for Advanced Financial Education (CAFE,) Gildea got first-hand experience investing real money in 2020's unpredictable stock market. She began to wonder why so many new investors were entering the market while it was responding to the pandemic, and set out to answer this question through her research.

"I wanted to be able to educate the people I am surrounded by. I am a young investor, and a lot of people in my classes are as well. I wanted to be able to break down what happened in 2020 so that people could understand it and have a better idea of what to do in the market moving forward, and to make better educated decisions about their investments," said Gildea.
Senior Finance and Economics major Emily Gildea, from Palos Park, Ill., presents her Honors Capstone Project "Educating Retail Investors in a Volatile Market."

Showcasing Music

The day ended with SASH's Music Showcase, where student musicians shared their talents with the campus community.

Sophomore Music and History major Lindsey Whitehead, from Glenview, Ill., performed Sonata No. 1 in F Minor, Op. 2, No. 1, I. Allegro by Ludwig van Beethoven on the piano.

"Beethoven is a very intimidating composer who creates equally intimidating works. What’s written on the page and technique can only bring you so far when playing a Beethoven sonata. You have to have
to approach it with passion and gusto," said Whitehead.

Senior Communication & Media Studies major and Music minor Zuri Soto, from Shelton, Conn., chose to sing "Corner of the Sky" from the musical *Pippin* due to its emotional content and her connection to the piece.

"Performing this piece meant a lot to me as a senior because it was able to capture my personal journey while having an emphasis on my future goals. Even though I have accomplished a great deal during my four years at Roger, I am prepared to use my talents and knowledge in the next chapter of my life," said Soto.
Project management:

- Weekly meetings
  - Agenda
  - Meeting Minutes
  - Gantt Chart
  - Action items
- Google Drive
- Communication and Organization
Design Process

Research
- Site Visit
- Interviews
- Book
- Individual Research

Brainstorm
- Concept Development
- Concept Selection

Test
- Fatigue & Ultimate Loads
- Material Selection

Process
Fireflies, Frogs, Owls, Trees, and More: The Importance of Nature Exploration With Children
By: Courtney Cassette; Dual Majors: Educational Studies & English Literature

Introduction

Purpose

The purpose of this study is to explore how nature plays a role in the learning process of children. This study will focus on understanding the impact of nature-based learning on children's academic performance and overall well-being.

Theoretical Frame

Methodology

Data Collection

Data Analysis

Conclusion

Recommendations

References
COVID-19 Pandemic Volterra Integral Equation

**Introduction**

The COVID-19 pandemic is a global health crisis that has affected millions of people worldwide. The spread of the virus is modeled using Volterra integral equations, which allow for the analysis of the dynamics of infections and recoveries over time. This approach is particularly useful because it can incorporate various factors, such as the rate of new cases and the recovery rate, into a single mathematical framework.

**Volterra Integral Equation**

The Volterra integral equation is given below:

\[
\frac{dX(t)}{dt} = \int_{0}^{t} K(t,s)X(s)ds + f(t)
\]

where \(X(t)\) is the number of infected individuals at time \(t\), \(K(t,s)\) is the kernel function representing the rate of infection, and \(f(t)\) is an external forcing function.

**Numerical Results**

The numerical results are presented in the following table:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\alpha)</td>
<td>0.25</td>
</tr>
<tr>
<td>(\beta)</td>
<td>0.3</td>
</tr>
<tr>
<td>(\gamma)</td>
<td>0.1</td>
</tr>
</tbody>
</table>

**Conclusions**

The model predicts that the peak of the pandemic will occur in the next few months, with the number of cases expected to decrease by the end of the year. Further research is needed to refine the model and improve its accuracy.

**References**

4. USA Today (2020). Retrieved from wwwusatoday.com

**Authors**

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**Affiliation**

University of Illinois at Urbana-Champaign

**Date**

March 1, 2021
Project management

- Weekly meetings
  - Agenda
  - Meeting Minutes
  - Grant Chart
  - Action Items
- Google Drive
- Communication and Organization
Fireflies, Frogs, Owls, Trees, and More: The Importance of Nature Exploration With Children

By: Courtney Cassette; Dual Majors: Educational Studies & English Literature

Introduction

Purpose

Theoretical Framework

Conclusion

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Part 8: Learning at Camp
Part 9: Learning By Camp
Part 10: Learning at Camp

Acknowledgments

References

COVID-19 Pandemic Volterra Integral Equation

Introduction
The COVID-19 pandemic has caused significant challenges to public health systems worldwide. One approach to understanding the spread of the virus is through mathematical modeling. The Volterra integral equation has been used to model the spread of infectious diseases. In this research, we focus on the Volterra integral equation to model the COVID-19 pandemic. The model considers the effects of quarantine, social distancing, and vaccination on the spread of the virus.

Volterra Integral
The Volterra integral equation is a type of integral equation in which the unknown function appears under an integral sign. It can be written in the form:

\[ f(t) = g(t) + \int_{a}^{t} K(t,s)f(s)ds \]

where \( f(t) \) is the function we want to determine, \( g(t) \) is a known function, and \( K(t,s) \) is the kernel of the integral equation.

Numerical Results
Numerical results obtained from the model are presented in the following tables. The tables show the number of infected individuals, the number of recovered individuals, and the number of deceased individuals at different time points.

Table 1: Number of Infected Individuals

<table>
<thead>
<tr>
<th>Time</th>
<th>Infected Individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>1</td>
<td>200</td>
</tr>
<tr>
<td>2</td>
<td>300</td>
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</tbody>
</table>

Table 2: Number of Recovered Individuals

<table>
<thead>
<tr>
<th>Time</th>
<th>Recovered Individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
</tr>
</tbody>
</table>

Conclusion
The model provides insights into the spread of COVID-19 and can be used to predict future trends. The effectiveness of interventions, such as quarantine and social distancing, can be evaluated through the model. Further research is needed to refine the model and improve its accuracy.

Assumptions and Limitations
- The model assumes that the population is homogeneous and that the transmission rate is constant.
- The model does not account for the effects of variation in transmission rates due to age, gender, or behavior.
- The model assumes that the population is static and does not account for population growth or decrease.

Future Work
- The model could be extended to include the effects of vaccination and immunity.
- The model could be calibrated to fit real-world data to improve its accuracy.

References
Project management

- Weekly meetings
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