NCUR 2021 Proceedings

Breaking out of the Traditional: Implementation of an Educational Robot in the Faculty of Engineering

Electrical & Computer Engineering - Time: Tue 2:00pm-3:00pm - Session Number: 4534
Khaled Elmalawany, and Dr. Denis Onen, Department of Electrical Engineering, University of Calgary, 2500 University Dr NW, Calgary, AB T2N 1N4
Khaled Elmalawany

North American post-secondary institutions currently face a significant educational concern among engineering
students. It is known that the projection of the instructor's voice over a visual representation of the material, commonly
known as the traditional method, may be less effective on the actual understanding of knowledge. This study aims to
analyze how such teaching methods can be better targeted or altered to improve the educational experience. Specifically,
it investigates whether the development and implementation of an educational robot in a post-secondary classroom
setting have an impact on the application of education using an active approach instead of a purely theoretical approach.
In this context, an educational robot that this study focused on building to align with the learning outcomes of a course in
the Aerospace and Mechatronics minors at the Schulich School of Engineering at the University of Calgary.

To test the hypothesis that the implementation of a robot as an educational resource would augment the students'
learning experiences, a course was developed to include various learning outcomes. This includes autonomous obstacle
detection, line-detection race, and PID controls. Various robots and devices were analyzed using testing procedures
developed as part of the study using MATLAB, Arduino, and microPython as well as analyzing battery life, price, and
durability. The results showed the best outcomes were performed by the ELEGOO Car Kit 3.0.

To test the hypothesis, the developed system and resources will be deployed and employed in an Electrical engineering
a course at the University of Calgary in the Winter 2021 semester.

North American post-secondary institutions currently face a significant educational concern among engineering
students. It is known that the projection of the instructor's voice over a visual representation of the

material, commonly
known as the traditional method, may be less effective on the actual understanding of knowledge. This study aims to
analyze how such teaching methods can be better targeted or altered to improve the educational experience. Specifically,
it investigates whether the development and implementation of an educational robot in a post-secondary classroom
setting have an impact on the application of education using an active approach instead of a purely theoretical approach.
In this context, an educational robot that this study focused on building to align with the learning outcomes of a course in
the Aerospace and Mechatronics minors at the Schulich School of Engineering at the University of Calgary.

To test the hypothesis that the implementation of a robot as an educational resource would augment the students'
learning experiences, a course was developed to include various learning outcomes. This includes autonomous obstacle
detection, line-detection race, and PID controls. Various robots and devices were analyzed using testing procedures
developed as part of the study using MATLAB, Arduino, and microPython as well as analyzing battery life, price, and
durability. The results showed the best outcomes were performed by the ELEGOO Car Kit 3.0.

To test the hypothesis, the developed system and resources will be deployed and employed in an Electrical engineering
a course at the University of Calgary in the Winter 2021 semester.

Mechanism of Age Associated Increase in Thrombogenecity: A Narrative Review

Biology - Time: Mon 3:00pm-4:00pm - Session Number: 2599
Abhisha Patel, Parnian Alavi and Dr. Nadia Jahroudi , Department of Medicine, University of Alberta, 116 St. and 85 Ave., Edmonton, AB, Canada T6G 2R3
ABHISHA PATEL, Parnian Alavi

Von Willebrand factor (VWF) is an adhesive protein that initiates thrombus formation and is exclusively expressed in endothelial cells that line blood vessels and platelets. VWF promotes platelet aggregation at the site of vascular injury to prevent blood loss while the repair of the injured vessel proceeds. Circulating levels of VWF protein have been reported to increase with aging and this can lead to excessive platelet aggregation and potentially unwanted thrombus formation. The objective of this review is to discuss the impact of aging on VWF levels, Von Willebrand disease (VWD), VWF cleaving enzyme ADAMTS13 levels, a potential mechanism of the age-associated increase in VWF levels, and involvement of VWF in thrombotic events in COVID-19 patients. We performed comprehensive searches through the Scopus and MEDLINE/PubMed databases which were restricted to English sources. The following main keywords were employed: "VWF and aging", "aging and thrombosis", "aging and VWD", and "VWF and COVID-19". We discussed studies reporting increased VWF levels with aging in a healthy population and VWF levels in elderly patients with VWD. Additionally, studies reporting association of VWF with other aging-associated comorbidities, and association of inflammation, circadian regulators, dehydration, hypernatremia, ADAMTS13 activity, and SARS-CoV-2 infection with circulating VWF levels were included. A review of the available

information regarding the role of the age-associated increase in VWF and its contribution to thrombotic complications provides insight towards planning further studies with the aim of therapeutic interventions. It is vital to investigate the mechanism of the age-associated increase in plasma VFW levels in order to eliminate severe thrombotic complications in the elderly.

Von Willebrand factor (VWF) is an adhesive protein that initiates thrombus formation and is exclusively expressed in endothelial cells that line blood vessels and platelets. VWF promotes platelet aggregation at the site of vascular injury to prevent blood loss while the repair of the injured vessel proceeds. Circulating levels of VWF protein have been reported to increase with aging and this can lead to excessive platelet aggregation and potentially unwanted thrombus formation. The objective of this review is to discuss the impact of aging on VWF levels, Von Willebrand disease (VWD), VWF cleaving enzyme ADAMTS13 levels, a potential mechanism of the age-associated increase in VWF levels, and involvement of VWF in thrombotic events in COVID-19 patients. We performed comprehensive searches through the Scopus and MEDLINE/PubMed databases which were restricted to English sources. The following main keywords were employed: "VWF and aging", "aging and thrombosis", "aging and VWD", and "VWF and COVID-19". We discussed studies reporting increased VWF levels with aging in a healthy population and VWF levels in elderly patients with VWD. Additionally, studies reporting association of VWF with other aging-associated comorbidities, and association of inflammation, circadian regulators, dehydration, hypernatremia, ADAMTS13 activity, and SARS-CoV-2 infection with circulating VWF levels were included. A review of the available information regarding the role of the age-associated increase in VWF and its contribution to thrombotic complications provides insight towards planning further studies with the aim of therapeutic interventions. It is vital to investigate the mechanism of the age-associated increase in plasma VFW levels in order to eliminate severe thrombotic complications in the elderly.