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Editorial

This is the Volume 19, Number 2 issue of the OUSL Journal, the Journal of The Open University of Sri Lanka which is published biannually. The articles published in this volume include research based on the disciplines of Mechanical Engineering, Psychology, Agriculture, Teaching Learning Process and Chemistry.

The study on *The Effect of Silicon Deficiency on Material Properties of Noduar Cast Iron*, describes the following findings. The unexpected failures of automotive components might lead to fatal accidents and injuries to vehicle occupants and pedestrians. Analyses from different perspectives of automotive component failures are important to ensure that a failure does not recur. The crankshaft is considered the heart of a piston engine. The crankshafts are subjected to torsion combined with rotary bending stresses. Possible sources for the failure of crankshafts can be categorized as operating or mechanical sources. The main operating sources are operating in the absence of oil or defective oil lubrication, high operating oil temperature and improper use of the engine, such as over revving or overloading. The main mechanical sources are misalignment, stress concentration, improper heat treatment, improper material composition, incorrect design, excessive vibration, improper clearance and incorrect size bearings. Crankshafts of internal combustion engines are subjected to a complex stress state and are prone to fail prematurely for various reasons. The effect of chemical composition on material parameters of a crankshaft made of nodular cast iron is presented in this paper. The engine is a four-stroke four-cylinder gasoline engine with a displacement of 1498 cc, developing a power of 52 kW at a rate of 4800 rev/min. At the time of failure, the engine undergoes a full load performance test on an engine dynamometer. The analysis revealed that the material properties of the crankshaft were inferior to those encountered in the literature. The yield stress, tensile strength and hardness values were approximately 50% lower than those reported by other researchers. There exists a strong relationship of Si concentration with strength, microstructural defects and formation of shrinkage pores. Chemical analysis revealed a deficiency in Si concentration that deteriorated physical properties. The crankshaft was used as cast without heat treatment. A proper heat treatment could increase the mechanical properties, thus increasing the fatigue strength. The failure could be attributed to the low material quality and deterioration of physical properties.

The article titled *Understanding Women's Horrors in Refugee Camps through Silence is My Mother Tongue*, explores the psychological and social challenges faced by women refugees in refugee camps worldwide. Using a semifictional narrative from *Silence is My Mother Tongue* by Sulaiman Addonia, this study examines the mental health impacts of displacement and the compounded marginalization of refugee women in patriarchal societies. It addresses key thematic issues such as identity construction, resilience, gender-based violence, female autonomy and social protection. This article also critically reviews human rights frameworks and the role of humanitarian agencies in addressing the needs of female refugees. The study emphasizes the importance of gender-sensitive policies and aims to contribute to the ongoing discourse on gender justice for displaced women. Using a literary research paradigm, the article discusses how refugee women navigate their experiences in camps offering insight into the broader implications for policy and humanitarian practice.

The study on *Growth and Yield of Salad Cucumber (Cucumis sativus L.) Vine Cuttings Under Protected House Conditions in Low Country Wet Zone of Sri Lanka*, explores the growth and yield of salad cucumber (*Cucumis sativus* L.) vine cuttings to minimize the seedling cost each time for a new crop cycle. A completely randomized design was used with four replicates. There were three treatments as apical end cuttings, lateral branch cuttings and control. Seedlings obtained from seeds were taken as the control. Two-node cuttings of 20 – 25cm in length were prepared from lateral branches and apical ends of salad cucumber mother plants. Growth and yield parameters were measured up to six weeks. Data were statistically analysed and results revealed that vine length, number of leaves per vine, fresh weight of fruits and number of fruits were significantly influenced by different treatments. Significantly higher vine length and number of leaves per vine were recorded by control plants at the end of six weeks. However, fresh weight of fruits and the number of fruits were significantly higher in plants obtained from apical end cuttings over control plants. However, fresh weight of fruits and the number of fruits in apical end cuttings were not significantly different with lateral branch cuttings. Moreover, these parameters in lateral branch cuttings were not significantly different with control plants. This study shows that salad cucumber plants obtained from vine cuttings reported a higher yield and cuttings can be successfully used to obtain new plants for the next crop cycle to reduce the seedling cost.

Depression and anxiety are common psychological problems among Army cadet officers, and they have been extensively researched in the world across varying populations. They are more susceptible to develop these mental health problems due to military training procedures and adjustment issues. Nevertheless, limited research has been conducted to investigate mental health conditions of the Army officer cadets in Sri Lanka. Hence, the purpose of the study on *Anxiety and Depression among Officer Cadets during the Army Basic Training in the Sri Lankan Army*, was to investigate the prevalence of depression and anxiety in Army officer cadets during basic army training as well as associated factors. A cross-sectional study was carried out among 236 officer cadets who had recently completed the training and ranged in age from 18 to 27 years. The prevalence of depression and anxiety was determined using a self-reported questionnaire that included the Depression, Anxiety and Stress Scale-21 and General Health Questionnire-30. Results revealed that the prevalence of anxiety was 43% while depression was reported 22% among the studied cadet officers. The positive correlation between depression and anxiety underscores the importance of implementing comprehensive interventions that address both conductions at the same time. Findings suggest the necessity of focused mental health support for cadet officers during this crucial time. Enhancing the mental health of Army officer cadets can be achieved through the implementation of tailored mental health support programmes that offer accessible resources, counselling services and coping mechanisms.

Ensuring the development of employability skills among business graduates is a significant challenge within the tertiary education system of Bangladesh. In this context, the implementation of the flipped classroom approach, as opposed to the traditional teaching model, could make a substantial contribution. The study on *Assessing Flipped Classroom Techniques for Business Management Education in Bangladesh*, examines the applicability of the flipped classroom strategy in Business Management courses in Bangladesh, aligning it with the country's university curriculum. Primarily based on secondary data, the research explores both the significance and challenges of adopting this approach. Additionally, the study identifies the roles of tutors and learners through a literature review, highlighting key factors for the successful and effective implementation of the flipped classroom technique. A critical evaluation of current practices is also presented to identify their limitations and to underscore the potential of the flipped classroom in fostering higher-order thinking skills. The study concludes with an action plan, including a lesson plan and rubrics, designed around the

flipped classroom model. Furthermore, it identifies potential challenges to implementation, emphasizing how this strategy can promote the development of higher-order skills among students. It is anticipated that this study will benefit tutors, academic institutions, education policymakers and administrators in Bangladesh by highlighting strategies to enhance the employability skills of Business Management graduates.

The article titled *Synthesis and Characterization of Iridium(III) Complexes Containing (ppy)$_2$Ir-unit and Nitrogen Based Donor Ligands*, describes that Octahedral cyclometallated Ir(III) complexes of the type [Ir(C^N)$_2$(N^N)]X have shown applications in the fields of photovoltaic cells, chemo-sensors, light-emitting devices (LEDs) and phosphorescent dopants in organic light-emitting diodes (OLEDs). [Ir(C^N)$_2$(N^N)]X can easily be prepared by reacting the [Ir(ppy)$_2$(μ-Cl)]$_2$ dimer with a bidentate ligand (N^N) in the presence of a suitable anion X. These Iridium(III) complexes possess important properties such as rigid configurational stability, high emissive quantum yields, long phosphorescence lifetime (in μs) and high electrochemical stability. Luminescent Ir(III) polypyridine complexes are also candidates for biomolecular and cellular probes. Parameters such as water solubility, lipophilicity, cytotoxicity, cellular uptake and intracellular localization could all be tuned by using various cyclometallated (C^N) and polypyridine (N^N) ligands. Some of the ligands used to explore the chemistry of Iridium(III) complexes are monodentate pyridine ligand, L^1 = 4-dimethylamino pyridine (DMAP), bridging ligand, L^2 = di(4-pyridyl) acetylene (DPA), and bidentate N^N ligands = 6,6′-dimethyl-2,2′-bipyridine (L^3), 6,7-di(4-*tert*-butylphenyl)-5,8-diphenyl-1,12-diazatriphenylene (L^4), tetraphenyl-2,2′-bipyridine (L^5), and 7,10-di(4-*tert*-butylphenyl)-9-(2-pyridyl)-8-azafluoranthene (L^6). Synthetic routes to the complexes of the type [Ir(ppy)$_2$(L)Cl], [Ir(ppy)$_2$(L)$_2$]PF$_6$, [Ir(ppy)$_2$(N^N)]PF$_6$ and [(ppy)$_2$ClIr]$_2$(μ-L) have been devised where ppy = 2-pyridylphenyl.

We welcome your suggestions for further improvement of this Journal. We are looking forward to publishing your current research findings in our next issue.

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