

2019

**ACADEMIC INTELLECTUAL**  
INTERNATIONAL INVENTION,  
INNOVATION & DESIGN BOOK

Published by : Student Affairs Department,  
Universiti Teknologi MARA Kedah,  
P.O. Box 187, 08400 Merbok, Kedah, Malaysia.

Patron : Dr. Wan Irham Ishak  
Dr. Abd Latif Abdul Rahman

Project Manager : Yazwani Mohd Yazid

Design Director : Mohd Hamidi Adha Mohd Amin  
Fadila Mohd Yusof

Editorial Director : Mohd Hamidi Adha Mohd Amin  
Mas Aida Abd Rahim

Copyright © 2019 Student Affairs Department, Universiti Teknologi MARA Kedah.

No part of this publication may be reproduced, stored in retrieval system, or transmitted in any form or by means, electronic, mechanical, photocopying, recording, or otherwise, without the prior permission of the publisher.

**ISBN : 978-967-0314-71-6**

Printed by : Perpustakaan Sultan Badlishah,  
Universiti Teknologi MARA Kedah,  
P.O Box 187, 08400 Merbok, Kedah, Malaysia.

89.	Dadu BiMate TJI: AN INNOVATION OF BOARD GAME FOR FUN AND EFFECTIVE NUMBER, BASIC OPERATIONS AND BASIC MEASUREMENT FACTS LEARNING IN PRIMARY MATHEMATICS	91
90.	ANICARE	92
91.	PEMPEK BO SANG (FISHCAKE MADE OF BANANA'S FLORAL STEM)	93
92.	EXAMINATION MANAGEMENT SYSTEM (EXAMS)	94
93.	KLEAN	95
94.	MUSON (MUSHROOM NOODLE) INNOVATION OF HEALTHY FOOD PRODUCTS FROM OYSTER MUSHROOMS WITH NEW INNOVATION AS A POTENTIAL BUSINESS OPPORTUNITY IN PUBLIC SECURITY	96
95.	TENAGA GUNA SEMULA (TEGUSE)	97
96.	ANALISIS PUNCA MASALAH PEMBELAJARAN OPERASI TOLAK DALAM LINGKUNGAN 10 DAN KEUPAYAAN BITOBI MATCH-UP DALAM MENGATASI MASALAH: KAJIAN RINTIS	98
97.	IMPROVING STUDENTS AWARD SELECTION PROCESS THROUGH THE DEVELOPMENT OF AKSIS (ANUGERAH KECEMERLANGAN SISWA) WEB INFORMATION SYSTEM	99
98.	IMPROVING RECORDS' MANAGEMENT PRACTICES VIA ATTENDANCE MONITORING SYSTEM (AMOS)	100
99.	DELAT ADLER: THE PORTABLE AND VERSATILE ELECTRCITY GENERATOR.	101
100.	DISASTER E-DRONE PREVENT INCREASING OF VICTIM ENGLISH!	102
101.	SPEAK UP SYSTEM	103
102.	H-BALM: HARUMANIS-BASED RELIEVING PRODUCT	104
103.	H-CUBE: INNOVATIVE HARUMANIS PERLIS PRODUCT	105
104.	DARE TO INVEST: CREATIVE MIND AND INNOVATIVE IDEA	106
105.	POLYVALENT CARREL	107
106.	Ezi4BANNER 2.0	108
107.	RANGGU " THE NATURAL COLOUR"	109
108.	SMART EMERGENCY DRONE FOR MANAGEMENT OF DISASTER	110
109.	SMARTOVATION YUZA WITH LONG DEPENDABLE WIRES	111
110.	THE CONVERSION OF THERMOELECTRIC ENERGY INTO ELECTRICAL ENERGY IN APPLICATION OF DEREM CHARGER	112
111.	TEH HARUMANIS PERLIS	113
112.	CAR CARBON MONOXIDE DETECTOR ( CARMOD )	114
113.	RECYCLE BIN : WASTE BUSINESS PLATFORM TO IMPROVE SCAVENGER'S CHILDREN EDUCATION BASED ON MOBILE APPLICATION	115
114.	SMART WUDHUK	116
115.	CAPTION (CANTILEVER PIEZOELECTRIC ENERGY HARVESTER WITH ENERGY BANK SYSTEM FOR FISHERMAN) AS AN ALTERNATIVE TECHNOLOGY INNOVATION TO OPTIMIZE MARITIME ENERGY RESOURCES	117
116.	AUTO WATER RECLOSE	118
117.	WIRELESS AIR POLLUTION DETECTOR (MAGIC NOZZ)	119
118.	E-CAMFINDER LEARNING APPLICATION	120
119.	ROTARY GRILL-gen2	121
120.	GARBARGAIN : A SOLUTION FOR PRA-PROSPEROUS COMMUNITIES BY EXCHANGED GARBAGE TO GET THE SUITABLE LEFTOVER FOOD	122

# INNOVATION

## CATEGORY

# **CAPTION (CANTILEVER PIEZOELECTRIC ENERGY HARVESTER WITH ENERGY BANK SYSTEM FOR FISHERMAN) AS AN ALTERNATIVE TECHNOLOGY INNOVATION TO OPTIMIZE MARITIME ENERGY RESOURCES**

**Mohammad Mufti Fajar, Thomi Febriyan Lukhito, Made Ayu Sekarrini, Dewi Nur Ayuningtya, and Lintang Gadis Ratu Rachellya<sup>1</sup>**

*Brawijaya University, Indonesia.*

According to data from the Indonesia Ministry of Maritime Affairs and Fisheries, Indonesia has around 5,800,000 square kilometers of ocean with a coastline of around 97,000,000 kilometers. As archipelagic country with many territorial waters, it is not surprising that many Indonesians choose to work as fishermen. Based on data from National Destructive Fishing in 2013, the number of traditional fishermen reached more than 864,000 people. But unfortunately, the majority of these traditional fishermen belong to the lagging community of technological progress, including electricity needs. In fact, electricity is now a core requirement for every human activity. Therefore, it is necessary to get alternative and renewable electrical energy that utilizes daily fishing activities. Renewable electrical energy that the authors offer comes from the utilization of sea water waves assisted by the performance of cantilever piezoelectric. Piezoelectric is a certain solid material that can convert vibrations or deflection to become electrical energy. Five Piezoelectric pieces are arranged in two gearboxes and placed on the side of the ship to interact with ocean waves. Sea waves will move the synthetic buoy up and down so it also will trigger the movement of the rack gear at pinion which can make deflections on piezoelectric and produce electrical energy. This electricity will be stored in the accumulator or battery around 6-8 hour first. The result shows that this system will create 17.84 Wh to 22.12 Wh of energy. The electricity can be used for daily needs or commercialized. Thus, the authors expected that through this CAPTION who based on piezoelectric and ocean wave mechanism, these can fill up the electricity needs of traditional fishing communities while increasing the economy through the sale of electricity



UNIVERSITI  
TEKNOLOGI  
MARA

Cawangan Kedah  
Kampus Sungai Petani



KEMENTERIAN  
PENDIDIKAN  
MALAYSIA

**MRM**  
MALIS REKABENTUK MALAYSIA

ISBN 978-967-0314-71-6



9 789670 314716