Turnitin Originality Report

Processed on: 05-Mar-2021 07:23 WIB
ID: 1524532858
Word Count: 3787
Submitted: 1

Similarity Index	Similarity by Source
20%	Internet Sources: 10% Publications: 13% Student Papers: 8%

Baby Incubator Monitoring Center for Temperature and Humidity using WiFi Network By I. Dewa Gede Hari Wisana

4% match (student papers from 13-Nov-2019)
Submitted to Nelson Mandela Metropolitan University on 2019-11-13

2% match (publications)
Ade Putra, Tri Bowo Indrato, Liliek Soetjiatie. "The Design of Oxygen Concentration and Flowrate in CPAP", Journal of Electronics, Electromedical Engineering, and Medical Informatics, 2019

2% match (Internet from 23-Dec-2020)
https://download.atlantis-press.com/proceedings/icihc-18/55916770

2% match (publications)
Riska Setyawati, Priyambada Cahya Nugraha, Her Gumiwang Ariswati, Nur Hasanah Ahniar. "An Improved Measurement Accuracy of Fetal Heart Rate using Digital Filter", Indonesian Journal of electronics, electromedical engineering, and medical informatics, 2020

1% match (publications)
Syarifatul Ainiyah, Dwi Herry Andayani, Andjar Pundji, M Shaib. "Development of Incubator Analyzer Based on Computer with Temperature And Humidity Parameters", Journal of Electronics, Electromedical Engineering, and Medical Informatics, 2020

1% match (publications)
Laily Nurrohmah, Dwi Herry Andayani, Andjar Pudji. "Development of Incubator Analyzer Using Personal Computer Equiped With Measurement Certificate", Journal of Electronics, Electromedical Engineering, and Medical Informatics, 2020

1% match (student papers from 04-Mar-2021)
Submitted to Politeknik Kesehatan Kemenkes Surabaya on 2021-03-04

1% match (Internet from 13-Aug-2019)
https://desire.giesecke.tk/index.php/2018/01/30/espnow-and-connection-to-wifi-ap/

1% match (publications)
Muhammad Fuad Nurillah, Bambang Guruh Irianto, I Dewa Gede Hari Wisana. "Pemantauan Apnea Berbasis Internet of Things dengan Notifikasi di Mobilephone", Jurnal Teknokes, 2020

1% match (publications)
Franciska Pramuji Lestari, Yeni Rian Sari, Fendy Rokhmanto, Talitha Asmaria, Andika Widya Pramono. "Surface Modification of Ti-6Al-4V Alloy By Anodization Technique at Low Potential to Produce Oxide Layer", Journal of Electronics, Electromedical Engineering, and Medical Informatics, 2020

1% match (publications)
Nur Fildzah Hidayati, Endro Yulianto, Abd. Kholiq. "Baby Incubator Based on PID Control With Kangaroo Mode (Kangaroo Mode and Humidity)", Journal of Electronics, Electromedical Engineering, and Medical Informatics, 2019

1% match (Internet from 17-Dec-2020)
https://randomnerdtutorials.com/esp-now-two-way-communication-esp32/

1% match (Internet from 31-Jan-2021)
http://spmi.poltekba.ac.id/spmi/digilib/detil_ta.php?go=OK&id=756&view=4

1% match (Internet from 17-Aug-2020)
https://randomnerdtutorials.com/esp-now-one-to-many-esp32-esp8266/

Baby Incubator Monitoring Center for Temperature and Humidity using WiFi Network Furi Kristya Palupi1, Sari Luthfiyah1, I Dewa Gede Hari Wisana1, Mohseena Thaseen2 1Department of Medical Electronics Engineering Technology of Politeknik Kesehatan Kementerian Kesehatan Surabaya Jl. Pucang Jajar Timur No. 10, Surabaya (60282), Indonesia 2NES Science College, Snehnagar, Nanded, Maharashtra 431605, India Article Info Abstract Article History: Received May 9, 2020 Revised Dec 20, 2020 Accepted Jan 20, 2021 Keywords: Baby Incubator Temperature Humidity Wireless ESP32. Monitoring the condition of premature babies inside the baby incubator is very necessary. Babies who are born prematurely with a birth age of less than 38 weeks have a higher risk of death and difficulty to adapt outside the womb due to immaturity of the organ system. Premature babies need continuous monitoring by the nurse to find out the baby's body condition remains stable in temperature and humidity to match the conditions in the womb. The purpose of this research to develop a baby incubator temperature and humidity monitoring system quickly and practically. As technology develops, the monitoring process that was initially carried out by looking directly at the baby incubator display, now developed with various innovations that make it easier to monitor premature babies. The baby incubator temperature and humidity monitoring center module via the WIFI network uses a temperature sensor and DHT 22 which will be sent via WIFI ESP 32 and the values obtained will be displayed on the Nextion TFT display. Based on the measurement results obtained the largest temperature error value of 2.083% at the incubator client 1 temperature at the measurement point 32 ° C. The results showed that the device has an average error suitable for use, because based on ECRI 415-20010301-01, the maximum allowable error limit is ± 1 ° C. The results of this study can be implemented to make it easier for nurses to monitor premature babies to avoid neglect. Corresponding Author: Sari Luthfiyah Department of Medical Electronics Engineering Technology Politeknik Kesehatan Kementerian Kesehatan Surabaya Jl. Pucang Jajar Timur No. 10, Surabaya (60282), Indonesia E-mail: sariluthfiyah @yahoo. co.id This work is an open access article and licensed under a Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA 4.0). I. INTRODUCTION Baby incubators are medical devices used to provide intensive care or protection for babies who have premature births and low birth weight. Normal infants are born with a gestational age of about 38-40 weeks with a body weight of around 2500- 4000 grams, but in premature infants the age of the womb is only 37 weeks or a body weight of less than 2500 grams of baby [1], [2]. Baby incubators help doctors monitor all the different aspects around the baby's environment, and make conditions similar to those in the mother's womb. Baby incubators help maintain the lives of premature babies and reduce infant mortality rates [3][4]. Various problems can be caused by premature birth. Premature babies have a higher risk of death compared to babies born at term. This is because they have difficulty adapting to life outside the womb due to the immaturity of their organ systems [5]. Newborns lose four times more heat than adults, resulting in a decrease in temperature. In the first 30 minutes the baby can experience a temperature drop of 3-4 °C.. In a room with a temperature of 20-25 °C baby's skin temperature drops around 0.3 °C per minute. The decrease in temperature is caused by heat loss by conduction, convection, evaporation and radiation. The baby's ability is not perfect in producing heat so the baby is very susceptible to experiencing hypothermia [6]–[10]. To avoid hypothermia, premature babies will be placed in a baby incubator to keep the baby's temperature and humidity stable. The temperature of the baby incubator is kept within normal limits around 32 °C to 36 °C and the temperature of the baby' s skin is kept at normal temperatures around 36 °C to 37 °C. Besides this humidity is also responsible for providing warmth to the breath and moist air entering the baby's lungs. The relative humidity needed> 70% [8], [11]–[13]. Humidity needs to be maintained also to help the stability of the baby's body temperature [14]. The baby incubator in the neonate room requires intensive monitoring from medical personnel to see the temperature and humidity. If the temperature of the incubator is hotter it can cause the baby's skin to burn, and if it is colder than the temperature needed it can cause hypothermia. Infants who experience heat loss (hypo-termia) are at high risk for getting sick or dying [9], [15], . Neo-natal mortality in Journal homepage: http://jeeemi.org/index.php/jeeemi/index 8 Indonesia is 47% of infant mortality and 3.5% of neonatal deaths due to hypothermia [16]. So that nurses at all times must monitor directly into the room to ensure the temperature at the incubator remains in accordance with the setting temperature. Every baby in an incubator has special care and is monitored at a certain time. However, negligence often occurs in monitoring the baby who is in the incubator, so that the temperature given to the baby is too hot or too cold due to the incubator heating system that is not maintained regularly and the servant The hospital is negligent in monitoring the temperature of the incubator, causing premature babies to die due to such negligence [17] Baby incubator monitoring was once made by Putra Syaiful Hidayat (2013) with the title Monitoring Baby Incubator Through a Wireless Computer Network, the device was delivered using Xbee Pro. Weaknesses in this tool are data processing and display processes using a computer. It was also made by Rizky Handayani Rayu (2014) with the title Temperature and Humidity Monitoring on the ATmega328 Microcontroller-Based Incubator, the delivery process still uses HC-12 wirelles but the device still uses wires. So it requires a long cable if you want to take measurements outside. Then once made by Wahyu Maulana Mardha (2016) with the title Monitoring Baby Incubator Via Wireless Equipped Nursecall, the delivery process is still using HC-11 or Bluetooth and display using a PC. Alvient Yuliant had made a tool with the title Design of Temperature and Humidity Monitoring Application on Internet-Based Baby Incubators (2015), but this device still uses a PC display. In 2018 a tool was made by Romi Andi Wijaya with the title Design of Temperature and Humidity Monitoring Tool in Internet-Based Baby Incubator, but this device still uses Character LCD. Based on these problems, then in this study the author proposed a temperature and humidity monitoring center for baby incubators based on a WIFI network". This tool can be used to facilitate the temperature and humidity monitoring of the incubator quickly and practically. This Article is composed of: Chapter 1 introduction, Chapter 2 Materials and Methods, Chapter 3 Results, Chapter 4 Discussion, Chapter 5 Conclusion, and Chapter 6 Reference II. MATERIALS AND METHODS A. Experimental Setup This study was used in preterm infants with births of less than 37 weeks. Data retrieval is done with 6 trials. B. Materials and Device This study uses temperature sensors (Dallas, DS18b20, China) to measure skin temperature in infants. Humidity sensor (DHT-22, SE-RHT03, China) is used to measure the temperature and humidity of a baby incubator. Microcontroller (ESP32, ESP32, China) for processing data [18]–[21]. LCD (Nextion, FT NX4827T043, China) for displaying temperature and humidity data [22]. Use the battery as a power supply (Toshiba, Li-ion, China). Charger module (Eshinede, AL540954336142, China) for battery charging. Thermohygrometer (Goldgood, HTC-6, China) is used as a comparison tool. C. Experiment In this study, the researchers measured the temperature and humidity values in the baby' s incubator and skin temperature in premature babies. D. The Diagram Block In (Fig. 1), the baby incubator temperature sensor, skin sensor and humidity sensor on the device will read according to the baby incubator temperature, the baby's skin temperature, and the humidity present in the baby incubator. The data will be read by and will be transmitted wirelessly by ESP 32 which has been designated as a client. The data is sent to another ESP 32 which is set as an access point. Data received by the ESP 32 access point will be obtained and the results will be displayed on the display. Skin Sensor Incubator temperatu re sensor CElSiePn3t21 Humidity Sensor Incubator treemspeenrsaotru Humidity CElSiePn3t22 Sensor ESP 32 Incubator Server Access Point temperatu re sensor ESP 32 Humidity Client 3 Sensor Skin Sensor Incubator temperatu re sensor ESP 32 Client 4 Humidity Sensor Fig 1. The diagram block Display Buzzer E. The Flowchart In (Fig. 2), when the On button is pressed, ESP32 will initialize the LCD. Then the sensor will read the temperature and humidity. The data obtained will be sent through ESP32 which has been set up as a client to ESP32 which has been set as an access point server. Data will be received by the ESP32 server access point and will be processed on ESP32. If the received skin temperature matches the specified set point, it will be displayed on the TFT LCD. If it does not match, the buzzer will light as a sign that the skin temperature does not match the set point. And the value of the skin temperature that is not appropriate will also be displayed on the TFT LCD. START LCD Receive Data Initialization In (Fig. 5) Nextion circuit TFT LCD which is connected to an ESP-32 by connecting pin ESP32 TX to Nextion TFT LCD pin, ESP32 pin RX to TX Nextion TFT LCD pin. TX RX RX TX +5 +5 Arduino Microcontroller Blutooth HC-05 Temperature NO Sending Data According to Buzzer Turns On Settings YES LCD screen Fig 2. The Flowchart F. Circuit 1) DHT-22 Connection In (Fig. 3), DHT-22 is connected to the ESP-32 circuit by connecting the sensor pin data outputs to digital ESP32. Fig 3. DHT-22 Connection 2) DS18b20 Connection In (Fig. 4) DS18b20 is connected to the ESP-32 circuit by connecting the sensor pin data outputs to digital ESP32. Fig 4. DS18b20 connectionCircuit of driver transistor 3) Nextion Connection Fig 5. Nextion connection III. RESULTS A. Results of Measurements In (Fig. 6), researchers measured the incubator temperature and humidity values using a baby incubator and the baby's skin temperature using phantom gel [23]–[26], and the results were compared with the standard. Fig 6. Results of measurements B. Listing program for Client This program to include the library ESP32, DHT22, temperature sensor, to connect with ESP32. In addition, the above program is an initialization to set ESP32 as a client. #include #include #include #include #include "DHT.h" #define DHTPIN 15 #define DHTTYPE DHT22 //-- --------- ------------- #define ONE_WIRE_BUS 4 #define CHANNEL 1 #define SENDCHANNEL 1 #define WIFI_DEFAULT_CHANNEL 1 OneWire oneWire(ONE_WIRE_BUS); DallasTemperature sensors(&oneWire); DHT dht(DHTPIN, DHTTYPE); uint8_t ba[] = {0xA4, 0xCF, 0x12, 0x75, 0x92, 0x80}; esp_now_peer_info_t peer; void initESPNow(); void configDeviceAP(); void addPeer(uint8_t *peerMacAddress); void onDataSent(const uint8_t *ba, esp_now_send_status_t status); void onDataRecv(const uint8_t *mac_ addr, const uint8_t *data, int data _len); int atur1 = 0; int atur = 0; typedef struct struct_message1 { float suhu1; float kelembapan1; } struct_message1; struct_message1 client1; C. Program for sensors The temperature sensor is connected to pin 4 and the DHT- 22 sensor to pin 15. When the client succeeds in sending data to the access point server, "Sent with success" will appear on the serial monitor. When unable to send data, a "Error sending the data" message will appear. Sensor readings will be updated every 2000ms. void loop() { float h = (dht.readHumidity()); float t = dht.readTemperature(); float ta = t; addPeer(ba); client1.suhu1 = h; client1.kelembapan1 = t; esp_err_t result = esp_now_send(ba, (uint8_t *) &client1, sizeof(client1)); if (result == ESP_OK) { Serial.println(" Sent with success"); } else { Serial.println(" Error sending the data"); } delay(2000); } D. Listing program for connection and delivery process This program is for the connection process between client and server. As well as programs to find out whether the client and server have connected or failed to connect. void configDeviceAP() { String Prefix = "Slave:"; String Mac = WiFi.macAddress(); String SSID = Prefix + Mac; String Password = "123456789"; bool result = WiFi.softAP(SSID.c_str(), Password.c_str(), CHANNEL, 0); if (!result) { Serial.println(" AP Config failed."); } else { Serial.println(" AP Config Success. Broadcasting with AP: " + String(SSID)); } } void addPeer(uint8_t *peerMacAddress) { peer.channel = SENDCHANNEL; peer.ifidx = WIFI_IF_AP; peer.encrypt = 0; memcpy(peer.peer_addr, peerMacAddress, 6); esp_err_t addStatus = esp_now_add_peer(&peer); if (addStatus == ESP_OK) { // Pair success Serial.println(" Pair success"); } else if (addStatus == ESP_ERR_ESPNOW_NOT_INIT) { Serial.println(" ESPNOW Not Init"); } else if (addStatus == ESP_ERR_ESPNOW_ARG) { Serial.println(" Add Peer - Invalid Argument"); } else if (addStatus == ESP_ERR_ESPNOW_FULL) { Serial.println(" Peer list full"); } else if (addStatus == ESP_ERR_ESPNOW_NO_MEM) { Serial.println(" Out of memory"); } else if (addStatus == ESP_ERR_ESPNOW_ EXIST) { Serial.println(" Peer Exists"); } else { Serial.println(" Not sure what WENT WRONG"); } } // callback when data is sent from Master to Slave void onDataSent(const uint8_t *ba, esp_now_send_status_t status) { char macStr[18]; snprintf(macStr, sizeof(macStr), "┐x:┐x:┐x:┐x:┐x:┐x", ba [0], ba [1], ba [2], ba [3], ba [4], ba [5]); Serial.print(" Last Packet Sent to: "); Serial.println(macStr); Serial.print(" Last Packet Send Status: "); Serial.println(status == ESP_NOW_SEND_SUCCESS ? "Delivery Success" : "Delivery Fail"); } Serial. print(" Last Packet Sent to: "); Serial.println(macStr); Serial.print(" Last Packet Send Status: "); Serial.println(status == ESP_NOW_SEND_SUCCESS ? "Delivery Success" : "Delivery Fail"); } E. Temperature Measurement Result for client 1 and client 2 In (TABLE I), the results of the comparison between modules and comparator clients 1 and 2 at a temperature of 35 ° C. Data is collected when the temperature has begun to stabilize. Data collection was carried out with 6 measurements at each temperature. This instrument was compared with a thermohigrometer comparison device. From the measurement results of temperature 35 ° C obtained the smallest error value at the skin temperature of client 2 with a value of 0.191% for the highest error value at the incubator temperature of client 1 and client 3 with 0.333%. TABLE I. TEMPERATURE MEASUREMENT RESULT FOR CLIENT 1 AND CLIENT 2 Client 1 Client 2 Data Suhu incubator Skin Suhu incubator Skin A P A P A P A P 1 35 34.9 34.8 34.9 35 35 34.9 35 2 35.2 35 35 35 35.1 35.1 35 35.1 3 35 34.9 34.7 34.9 35 34.9 34.9 34.9 4 35.1 35 34.9 35 35.1 35 34.9 35 5 35.2 35.1 35 35.1 35 34.9 34.8 34.9 6 35.1 35 35 35 35.2 35 35 35 Rata- rata 35.1 34.98 34.9 34.98 35.06 34.98 34.91 34.98 SD 0.089 0.075 0.126 0.075 0.082 0.075 0.075 0.075 Error % -0.333 % 0.238 % -0.238 % 0.191 % F. Temperature Measurement Result for client 3 and client 4 In (TABLE II.), the results of the comparison between modules and comparator clients 3 and 4 at a temperature of 35 ° C. Data is collected when the temperature has begun to stabilize. Data collection was carried out with 6 measurements at each temperature. This instrument was compared with a thermohigrometer comparison device. From the measurement results of temperature 35 ° C obtained the smallest error value at the skin temperature of client 2 with a value of 0.191% for the highest error value at the incubator temperature of client 1 and client 3 with 0.333%. TABLE II. TEMPERATURE MEASUREMENT RESULT FOR RESPONDEN Data Design Client3 Temperature Cal. Design Client 4 Temperature Ca. 1 35 34.9 35.1 35 2 35.1 35 35 35 3 35.2 35.1 35 34.9 4 35.1 35 35.1 35 5 35 34.9 35.3 35.1 6 35.2 35 35 34.9 mean 35.100 34.983 35.083 34.983 SD 0.089 0.075 0.117 0.075 Error % -0.333 % -0.286 % IV. DISCUSSION In previous studies discussing making baby incubator monitoring tools with various sensors and delivery methods, but in previous studies there are still many shipping methods that must use a PC and router. Therefore, to follow up on the previous research as mentioned above, the research was carried out to make a temperature and humidity monitoring tool for baby incubators via a WIFI network. V. CONCLUSION After making the Baby Incubator Temperature and Humidity Monitoring Center module via a WIFI network using ESP-32 displayed on the TFT LCD, it is concluded that the device is suitable for use, because based on ECRI 415-20010301-01, the maximum allowable error limit is ± 1 ° C The testing of this tool is done by comparing the module with a standard measurement tool that produces a value of 2.090% at incubator 1 client temperature at a measurement point of 32 ° C. The results of this study can be implemented on an infant incubator to test premature babies and help neglect. Further development of this research can use temperature sensors and humidity sensors which have a higher level of accuracy REFERENCES [1] D. A. Kurniasari, S. Si, and E. Dian, "Monitoring Baby Incubator Berbasis PC Melalui Transmitter dan Receiver (Parameter Suhu Skin dan BPM)," 2007. [2] H. B. D. L. Mathew, Ashish Gupta, "Controlling of Temperature and Humidity for an Infant Incubator Using Microcontroller," Int. J. Adv. Res. Electr. Electron. Instrum. Eng., vol. 04, no. 06, pp. 4975–4982, 2015. [3] M. Ali, M. Abdelwahab, S. Awadekreim, and S. Abdalla, "Development of a Monitoring and Control System of Infant Incubator," 2018 Int. Conf. Comput. Control. Electr. Electron. Eng. ICCCEEE 2018, no. Lcd, pp. 1– 4, 2018. [4] M. Shaib, M. Rashid, L. Hamawy, M. Arnout, I. El Majzoub, and A. J. Zaylaa, "Advanced portable preterm baby incubator," Int. Conf. Adv. Biomed. Eng. ICABME, vol. 2017-Octob, pp. 1–4, 2017. [5] D. Sulistiarini and M. Berliana, "Faktor-Faktor yang Memengaruhi Kelahiran Prematur di Indonesia : Analisis Data Riskesdas 2013," E- Journal Widya Kesehat. dan Lingkung., vol. 1, no. 2, pp. 109–115, 2016. [6] L. Mochamad, I. D. G. H. Wisana, and M. Prastawa, "Seminar Tugas Akhir Juni 2016," no. 2013, pp. 0–5, 2017. [7] I. A. Abdulrazzak, H. Bierk, and L. A. Aday, "Humidity and temperature monitoring," Int. J. Eng. Technol., vol. 7, no. 4, pp. 5174–5177, 2018. [8] L. Nachabe, M. Girod-Genet, B. ElHassan, and J. Jammas, "M-health application for neonatal incubator signals monitoring through a CoAP- based multi-agent system," 2015 Int. Conf. Adv. Biomed. Eng. ICABME 2015, pp. 170–173, 2015. [9] D. D. Vyas, "System for Remote Monitoring and Control of Baby Incubator and Warmer," no. May 2016, 2017. [10] B. Ashish, "Temperature monitored IoT based smart incubator," Proc. Int. Conf. IoT Soc. Mobile, Anal. Cloud, I-SMAC 2017, pp. 497–501, 2017. [11] W. H. O. Vaccine, "Temperature and humidity monitoring systems for fixed storage areas," World Heal. Organ., 2014. [12] M. Bogdan, "How to Use the DHT22 Sensor for Measuring Temperature and Humidity with the Arduino Board," ACTA Univ. Cibiniensis, vol. 68, no. 1, pp. 22–25, 2017. [13] R. A. Koestoer, N. Pancasaputra, I. Roihan, and Harinaldi, "A simple calibration methods of relative humidity sensor DHT22 for tropical climates based on Arduino data acquisition system," AIP Conf. Proc., vol. 2062, no. February, 2019. [14] L. A. S. Lapono, "SISTEM PENGONTROLAN SUHU DAN KELEMBABAN PADA INKUBATOR BAYI," Medicalogy, p. 1, 2017. [15] M. Suruthi and S. Suma, "Microcontroller Based Baby Incubator Using Sensors," pp. 12037–

12044, 2015. [16] S. H. Hj. Nurlaila1), Rahmawati Shoufiah3), "Hubungan Pelaksanaan Perawatan Metode Kanguru (Pmk) Dengan Kejadian Hipotermi Pada Bayi Berat Lahir Rendah (Bblr)," vol. III, no. 9, pp. 466–472, 2015. [17] R. H. Rayu and L. O. Faasi, "PEMANTAU SUHU DAN KELEMBABAN PADA INKUBATOR BERBASIS MIKROKONTROLER ATmega328," Appl. Phys. A, vol. 73, pp. 1–21, 2014. [18] P. Rai and M. Rehman, "ESP32 based smart surveillance system," 2019 2nd Int. Conf. Comput. Math. Eng. Technol. iCoMET 2019, pp. 1–3, 2019. [19] S. Saha and A. Majumdar, "Data centre temperature monitoring with ESP8266 based Wireless Sensor Network and cloud based dashboard with real time alert system," Proc. 2nd Int. Conf. 2017 Devices Integr. Circuit, DevIC 2017, pp. 307–310, 2017. [20] Agus Kurniawan, "Internet of Things Projects with ESP32 . Birmingham B3 2BP UK," p. 32, 2019. [21] I. Allafi and T. Iqbal, "Design and implementation of a low cost web server using ESP32 for real-time photovoltaic system monitoring," 2017 IEEE Electr. Power Energy Conf. EPEC 2017, vol. 2017-Octob, pp. 1–5, 2018. [22] A. C. Bento, "IoT of Nextion X TFT ILI9341: Experimental Results and Comparative Survey," Int. Res. J. Eng. IT Sci. Res., vol. 4, no. 2, pp. 14–23, 2018. [23] F. Ho-yin Lai and F. Ho-yin Lai Silvia Hiu, "Application of Explanatory Sequential Designof Mixed Methods Research in Conciliating Qualitative and Quantitative Findingson Social Stressorsand To Examine the Social Problemsolvingorientation in Substance Abuse Population," vol. 4, pp. 969–974, 2019. [24] "Mobashsher, Abbosh - 2015 - Artificial human phantoms Human proxy in testing microwave apparatuses that have electromagnetic interact(2)- annotated.pdf." . [25] T. YAMAMOTO et al., "Improvement of Electrical Properties of Human Phantom inLow-Frequency Band by Using Carbon Microcoil," J. Japan Soc. Appl. Electromagn. Mech., vol. 21, no. 2, pp. 146–151, 2013. [26] C. -K Chou, G. -W Chen, A. W. Guy, and K. H. Luk, "Formulas for preparing phantom muscle tissue at various radiofrequencies," Bioelectromagnetics, vol. 5, no. 4, pp. 435–441, 1984. Journal of Electronics, Electromedical, and Medical Informatics (JEEEMI) Vol. 3, No. 1, January 2021, pp. 8-13 DOI: 10. 35882/jeeemi. v3i1 .2 ISSN:2656-8632 Journal of Electronics, Electromedical, and Medical Informatics (JEEEMI) Vol. 3, No. 1, January 2021, pp. 8-13 DOI: 10. 35882/jeeemi. v3i1 .2 ISSN:2656-8632 Journal of Electronics, Electromedical, and Medical Informatics (JEEEMI) Vol. 3, No. 1, January 2021, pp. 8-13 DOI: 10. 35882/jeeemi. v3i1 .2 ISSN:2656-8632 Journal of Electronics, Electromedical, and Medical Informatics (JEEEMI) Vol. 3, No. 1, January 2021, pp. 8-13 DOI: 10. 35882/jeeemi. v3i1 .2 ISSN:2656-8632 Journal of Electronics, Electromedical, and Medical Informatics (JEEEMI) Vol. 3, No. 1, January 2021, pp. 8-13 DOI: 10. 35882/jeeemi. v3i1 .2 ISSN:2656-8632 Journal of Electronics, Electromedical, and Medical Informatics (JEEEMI) Vol. 3, No. 1, January 2021, pp. 8-13 DOI: 10. 35882/jeeemi.v3i1.2 ISSN:2656- 8632 Journal homepage: http://jeeemi.org/index.php/jeeemi/index 9 Journal homepage: http://jeeemi.org/index.php/jeeemi/index 10 Journal homepage: http://jeeemi.org/index.php/jeeemi/index 11 Journal homepage: http://jeeemi.org/index.php/jeeemi/index 12 Journal homepage: http://jeeemi.org/index.php/jeeemi/index 13