

Ad Hoc Sensor Networks In Genetic Programming (Gp) And Transportation

Norliana Muslim¹, MohdHafizuddin Razale², MohdNorazmi Nordin³

¹*Department of Engineering, Faculty of Engineering and Life Sciences, Universiti Selangor*

²*Universiti Putra Malaysia*

³*Cluster of Education and Social Sciences, Open University Malaysia*

Abstract: Computing refers to the process through which computers are used or operated. During the operation of these devices, various concepts emerge; including genetic programming. For genetic programming, it refers to an artificial intelligence technique through which computers are encoded to assume the role of sets of genes. Further modifications or evolutions of the sets have seen genetic or evolutionary algorithms establish a computer program perform predefined tasks. Therefore, the state of the current global environment in which technologically-driven operations continue to dominate implies that inventions and innovations towards better outcome provision are inevitable. This criticality attracts an in-depth analysis of the concept of genetic programming.

1. INTRODUCTION

It is indisputable that developments in the computer technologies are the most celebrated achievements. This observation is considered accurate because computers are increasingly playing a crucial role in the current society. Computers technologies are now applied in the automation of services such as banking and security. Additionally, computers are applied in the storage of information. Indeed, they are a popular form of entertainment, such as computer games and movies. Computers have also enhanced communication through networking. As far as education is concerned, computers are facilitating research activities, and the list continues. Therefore, the roles played by computers are perceived to be so crucial that they have been argued to be a basic need to the current society. The aim of this study was to use secondary data to investigate trends in ad hoc sensor networks and their implication for vehicular networking, a contemporary trend in computer science. (Abdul Jalil et al., 2021; Mohd Noh et al., 2021; Mustafa et al., 2021; Roszi et al., 2021; Tumisah et al., 2021). If it is managed well, various problems can be avoided (Irma et al., 2021; Suzana et al., 2021; Rohanida et al., 2021; Nazrah et al., 2021; Shahrulliza et al., 2021).

Wireless modes of communication have received attention to such an extent that some of the cities in the world cannot operate without digital control systems. Notably, developments have been implemented beyond operations such as WLAN and mobile phones, witnessing the arrival of ad hoc sensor networks in cities such as London and Stockholm. According to Dargie and Poellabauer (2010), ad hoc sensor networks are established through communication nodes that are autonomous. The communication processes are realized via radio, excluding backbone infrastructures. Therefore, two nodes that are not within a range of mutual transmission can communicate using intermediate nodes to relay messages (Magno, Boyle, Brunelli, O'Flynn, Popovici, Benini, 2014). Ad hoc sensor networks can be applied in fields such as community mesh networks, disaster relief, data gathering, monitoring, and

surveillance. Notably, technological demands in the field of ad hoc sensor networks have led to further research to address the current challenges that smart cities face while providing services to the citizens. In vehicular networking, ad hoc sensor networks aid in establishing routing systems, medium access control, deployment strategies, topology control, and the design of energy efficient systems. The following figure shows a probable outlook of an ideal smart city (in which ad hoc sensor networks are effective).

All aspects require effective leadership and management (Mohd Arafat et al., 2021; Sumaiyah et al., 2021; Hifzan et al., 2021; Shahrul et al., 2021; Helme et al., 2021).

The success of something depends on good and efficient management (Mohd Ali et al., 2021; Parimala et al., 2021; SitiJamilah et al., 2021; Nor Fauziyana et al., 2021; Noel et al., 2021).

The best way is to do efficient management (Ahmad Shafarin et al., 2021; Junaidah et al., 2021; Farah Adibah et al., 2021; Ahmad Shakani et al., 2021; Muhamad Amin et al., 2021).

This demonstrates that the importance of something being managed well (Santibuana et al., 2021; Nor Diana et al., 2021; Zarina et al., 2021; Khairul et al., 2021; Rohani et al., 2021; Badaruddin et al., 2021, Abdul Rasid et al., 2021).

2. METHODOLOGY

In modern technologies, developments have been seen as responses to the ever-changing needs of product and service users, as well as the preferences of stakeholders. With this trend, organizations have had to embrace technology in a quest to keep abreast with stiff competition that comes with the current globalization- and technology-driven world. According to Subramanian, Lourenço and Chilingaryan et al. (2013), an incorporation of technology in role performance and task completion processes has also resulted due to the need to improve performance in creative and innovative ways. One of the technologies that have been affirmed to continually gain a widespread adoption, application, and implementation entails ad hoc sensor networks.

A study by Azimi, Bhatia, Rajkumar and Mudalige (2011) focused on the role of sensor networks in minimizing collisions among vehicles. Findings indicated that the evolution of ad hoc sensor networks accounts for the significant reduction of collisions at the intersections. In a similar study, Dargie and Poellabauer (2010) affirmed that there is a direct correlation between technology incorporation and safety among vehicles. Specifically, the improvement in safety was attributed to the real-time form of communication that the sensors offer. According to Kemal and Mohamed (2005), ad hoc sensor networks play a critical role in routing in which communication modes and signal provision may alert the drivers on possible routes that may be deemed safe and, with little traffic.

A study by Magno, Boyle and Brunelli et al. (2014) indicated that vehicular network and the incorporation of technologies accounts for the reduction of human errors that could, otherwise, emerge if transit operations in smart cities were solely reliant on the drivers' ability to establish the best routes and, preferable speeds. Kemal and Mohamed (2005) asserted that highly integrated forms of wireless sensing have led to improved forms of communication and safety, with the assertion suggesting that vehicular networking is critical because it strives to alleviate adversities on the road.

3. RESULTS AND DISCUSSION

In the field of ad hoc sensor networks, the aspect of routing messages from one source to another or from one source to multiple destinations is crucial. Information within smart cities

is disseminated by routing systems, either as anycast, broadcast, multicast, or unicast. It is worth noting that standard approaches have been established to achieve the routing processes — through the broadcast technique. The implication is that the ad hoc sensor networks are geared towards achieving efficiency in routing systems while seeking to serve the optimal amounts of overhead — generated by logarithms. However, the manner in which information is disseminated in smart cities in unicast, multicast, or anycast modes remains challenging (Kemal & Mohamed, 2005).

According to by Magno, Boyle and Brunelli et al. (2014), future transportations are perceived to gain from vehicular networking. Some of the key features of vehicular networking include the efficient management of traffic systems, standardization, infotainment, and road safety (Kemal & Mohamed, 2005). Particularly, the process of installing communication devices in roadside infrastructure components and cars has the moving vehicles communicate with other vessels in the network — because of the establishment of ad hoc networks that are ephemeral and rapidly changing. Furthermore, it is projected that moving vehicles will directly access network infrastructure, which will be fixed on the roadside, with smart cities perceived to be unexceptional.

In a study by Dargie and Poellabauer (2010), it was asserted that smart modern cities have numerous luxury cars in which central computers are embedded to serve the purpose of connecting various networks and systems. Furthermore, the cars are equipped with communication devices of wireless nature; including cell phones that provide telematics and Internet connection services when needed. In the end, ad hoc sensors and the concept of vehicular networking play a crucial role in enhancing safety by promoting real-time communication between vehicles. The following photograph illustrates how vehicular networking is applied in smart cities to minimize destruction during dangers such as fire. In the photo, cars that surround the region of disaster are fed with information from a central point of dissemination, upon which alternative routes are sought without necessarily causing traffic jams. Notably, the drivers establish alternative routes upon receiving information about the appropriate routes on which smooth traffic flows have been observed.

The criticality of ad hoc sensor networks and the promotion of vehicular networking mechanisms arise in the case of traffic congestion and impact monitoring. Traffic noise pollution, air quality pollution, and the emission of greenhouse gases result from the urban traffic. Thus, smart cities have devised mechanisms for minimizing the adverse effects of traffic congestion in a quest to reduce socio-economic losses. Specifically, ad hoc networks have enabled the realization of online monitoring of the times of travel and the behavior of drivers from the points of origin to the destinations. Other benefits that have resulted from ad hoc sensor networks and vehicular networking mechanisms include the reductions of air pollution and the reduction of the length of queues among city traffic systems.

Findings of the study indicated that the quality of service provision in one firm affects the quality of service provision in other firms. Therefore, the study could be merited for its provision of insight regarding the relationship between performance enhancement in companies and GP system implementation. However, the study did not explain differences that could emerge from structural and organizational operations in firms that adopt varied specialties of GP system implementation.

From the perspective of data warehousing, another practical illustration that could be used to illustrate the interaction with data mining systems is the case of Facebook. The latter site engages in data gathering off account user information such as the likes and friends of the individual, as well as persons who may be stalking him or her. In turn, the information is stored in a common repository. Whereas the data is stored in separate databases, the aim is to

obtain information that is deemed most important and relevant before channeling it to an aggregated database. A number of reasons prompt this procedure. For instance, the aim is to ensure that the account owner gains access to numerous and relevant ads, and to suggest to the account owner only friends who are deemed most relevant. Therefore, data warehousing in such an example involves data aggregation regarding activities such as likes and channeling the information to central databases while data mining implies that only the meaningful patterns and data are extracted (such as suggesting only relevant friends to the user). Given that data warehouses compile and organize information to form a common database while data mining extracts meaningful information from the resultant database, it is evident that the former precedes the latter. Similarly, this trend suggests that to detect meaningful patterns, data mining is dependent on the nature of data compiled during the warehousing procedure.

In summary, GP has emerged as a response to the ever-changing users needs and technological evolutions that have seen vices such as cyber attacks emerge. To address the issue of data leakage to unauthorized groups and curb possibilities of hacking activities, GP has emerged as a potential solution. The application assesses the ability of computer devices to perform specific tasks that they are assigned to accomplish. Whereas the application poses the merit of yielding convenience and accuracy, it has been criticized in situations where non-adaptive systems are adopted in an organization. Overall, GP utilization is on an increasing trend because of the need to embrace flexibility towards achieving dynamism, an element that the current social, cultural, economic and political environment demands. In future, it is evident that firms that will be in a continuous quest to keep abreast with industry demands and the needs and preferences of products and service users will have to foster data warehousing and mining to predict patterns such as buying behaviors. In so doing, it is projected that competitive advantages will be achieved due to the understanding of industry-specific needs of the consumers.

4. CONCLUSION

In conclusion, smart cities are characterized by a good economy, smart environments, smart mobility, smart living, smart people, and a smart system of governance. The aspect of information communications and technology (ICT) has emerged towards the future realization of perfect smart cities. The paper has examined the application of ad hoc sensor networks in smart cities. The manner in which ad hoc sensor networks can function has been highlighted, focusing on probable future applications of the sensorsystems. The field of vehicular networks has received attention because of the need to reduce traffic congestion. Additionally, sensor application has been associated with impactmonitoring. Ad hoc sensor networks have also led to the realization of online monitoring of the times of travel and the behavior of drivers from the points of origin to the destinations, accounting for significant reductions in traffic noise pollution, air quality pollution, and emissions of greenhouse gases in the urban traffic.

5. REFERENCES

- [1] Azimi, S., Bhatia, G., Rajkumar, R., and Mudalige, P. (2011). Vehicular Networks for Collision Avoidance at Intersections. *SAE Int. J. Passeng. Cars – Mech. Syst.* 4(1), 406-416. Retrieved from <https://users.ece.cmu.edu/~sazimi/SAE2011.pdf>

- [2] Dargie, W. and Poellabauer, C. (2010). *Fundamentals of wireless sensor networks: theory and practice*. John Wiley and Sons. Retrieved from <http://bayanbox.ir/view/4489134451971294360/Fundamentals-of-Wireless-Sensor-Networks-Waltenegus-Dargie.pdf>
- [3] Kemal, A. & Mohamed, Y. (2005). *A survey on routing protocols for wireless sensor networks*. University of Maryland, Baltimore County: Baltimore, MD. Retrieved from <http://www.csee.umbc.edu/~younis/Publications/JAdHoc/SensNetRouting.pdf>
- [4] Magno, M., Boyle, D., Brunelli, D., O'Flynn, B., Popovici, E. & Benini, L. (2014). Extended Wireless Monitoring Through Intelligent Hybrid Energy Supply. *IEEE Transactions on Industrial Electronics*, 61(4), 1871-1881. Retrieved from <http://disi.unitn.it/~somov/pdf/PID3577847.pdf>
- [5] Subramanian, S. K., Lourenço, C. B. & Chilingaryan, G. et al. (2013). Arm motor recovery using a virtual reality intervention in chronic stroke: randomized control trial. *Neurorehabilitation and Neural Repair*, 27, 13-23
- [6] Abdul Jalil Toha Tohara, Shamila Mohamed Shuhidan, Farrah Diana Saiful Bahry, Mohd Norazmi bin Nordin (2021). Exploring Digital Literacy Strategies for Students with Special Educational Needs in the Digital Age. *Turkish Journal of Computer and Mathematics Education Vol.12 No.9 (2021)*, 3345-3358.
- [7] Abdul Rasid Bin Abdul Razzaq, MohdNorazmi Bin Nordin, Mohamad Zaid Bin Mustafa, Badaruddin Bin Ibrahim (2021). Questionnaire for Special Education Leadership: A Pilot Study. *LINGUISTICA ANTVERPIENSIA*, 2021 Issue-1: 2587-2614
- [8] Ahmad Shafarin Bin Shafie, SitiNurKamariahBintiRubani, AiniNazuraBintiPaimin, NavaratnamVejaratnam, MohdNorazmi bin Nordin (2021). Elements of Safety In Job Satisfaction Of Special Education Teachers In Malaysia. *Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021)*, 5274-5278
- [9] Ahmad Shakani bin Abdullah, IklimaHusnaBinti Abdul Rahim, Mohammad Halim bin Jeinie, Muhammad Shakir Bin Zulkafli, MohdNorazmi bin Nordin (2021). Leadership, Task Load And Job Satisfaction: A Review Of Special Education Teachers Perspective. *Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021)*, 5300-5306
- [10] Ahmad SyarifuddinCheAbd Aziz, TumisahbintiAkim, Abdul Halim Bin Ruseh, SarinaBinti Mail, MohdNorazmi bin Nordin (2021). Elements of Facility In Job Satisfaction Of Special Education Teachers In Malaysia. *Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021)*, 5239-5243
- [11] Badaruddin Bin Ibrahim, MohdNorazmi Bin Nordin, Mohamad Zaid Bin Mustafa Abdul Rasid Bin Abdul Razzaq (2021). Special Education Need The True Leadership: The Review. *Turkish Journal of Physiotherapy and Rehabilitation*; 32(3): 1622-1628.
- [12] Farah Adibahbinti Ibrahim, Biamin Ahmad, Rehabbinti Ismail, Harlinabinti Ismail, MohdNorazmi bin Nordin (2021). Resource Elements In The Construct Of Special Education Teacher Workload In Malaysia. *Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021)*, 5289-5293
- [13] Farah AzalineyBintiMohd Amin, NoorsurayaMohdMokhtar, Farah Adibahbinti Ibrahim, Nishaalni, MohdNorazmi bin Nordin (2021). A Review Of The Job Satisfaction Theory For Special Education Perspective. *Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021)*, 5224-5228
- [14] Helme bin Heli, Senin M.S, Yusmi bin MohdYunus, KavitaVellu, Andrew Jason George, MohdNorazmi bin Nordin (2021). A Review Of The Educational Leaderships

- Theory For Special Education Perspective. Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021), 5217-5223
- [15] HelmeHeli, Senin M.S, EkmilKrisnawatiErlen Joni, JuereanorBinti Mat Jusoh, MohdNorazmi bin Nordin (2021). Elements Of Experience In The Leadership Construct Of Special Education Head Teachers In Malaysia. Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021), 5279-5283
- [16] HifzanBinti Mat Hussin, Nor MazlinaBintiMohamad, Syed Nurulakla Syed Abdullah, Ida RahayuMahat, MohdNorazmi bin Nordin (2021). Why Special Education Is Always In Our Hearts? Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021), 5202-5210
- [17] Irma ShayanaBteSamaden, Firkhan Ali Bin Hamid Ali, Nor ShadiraJamaluddin, Mazidahbinti Ali, MohdNorazmi bin Nordin (2021). Elements of Attitude In The Leadership Construct Of Special Education Head Teachers In Malaysia. Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021), 5151-5156
- [18] Irma ShayanaBteSamaden, IrfahNajihah, ShalizaAlwi, RabiatulMunirah, MohdAdli bin MohdYusof, MohdNorazmi bin Nordin (2021). Time Element In The Construct Of Special Education Teacher Workload In Malaysia. Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021), 5141-5145
- [19] Irma ShayanaBteSamaden, Senin M.S, Noor Lina bintiMohd Yusuf, Biamin Ahmad, MohdNorazmi bin Nordin (2021). A Pilot Study on The Influence Of Headmasters Leadership On Workload And Job Satisfaction Of Special Education Teachers In Johor, Malaysia. Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021), 5157-5171
- [20] JumiahbintiMustapa, SarinaBintiMohdYassin, FauziahbintiAni, Parimala A/P Palanisamy, MohdNorazmi bin Nordin (2021). Physiological Elements In Job Satisfaction Of Special Education Teachers In Malaysia. Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021), 5244-5248
- [21] JunaidahYusof, Farah Adibahbinti Ibrahim, Senin M.S, HilmiahBinti Haji Hassan, MohdNorazmi bin Nordin (2021). Elements of Work Environment In The Construct Of Special Education Teacher Workload In Malaysia. Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021), 5284-5288
- [22] KhairulHanimPazim, Roslinah Mahmud, Noor FzlindaFabeil, Juliana Langgat, MohdNorazmi bin Nordin (2021). Special Education Teachers Job Satisfaction In Malaysia: A Review. Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021), 5329-5332
- [23] Mohd Ali Masyhum bin Mohd Nor, Ahmad Faqih Ibrahim, SyahrulAnuar Ali, MohdFairozAffendy bin MdNordin, MohdNorazmi bin Nordin (2021). Elements of Leadership Style In The Leadership Construct Of Special Education Headmasters In Malaysia. Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021), 5249-5253
- [24] Mohd Ali Masyhum, Ophelia, Masliah Musa, DarainiOyot, MohdNorazmi bin Nordin (2021). Headmasters Leadership On Task Load And Job Satisfaction Of Special Education Teachers In Malaysia. Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021), 5294-5299
- [25] Mohd Arafat Bin Jaafar, Muhammad TalhahAjmain@Jima'ain, Mazitabinti Ahmad Subaker, KavitaDoraisamy, MohdNorazmi bin Nordin (2021). Special Education Teachers Task Load In Malaysia: A Review. Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021), 5333-5337

- [26] Mohd Arafat Bin Jaafar, Noor AzlinBinti Abdullah, MohdSabri Bin Jamaludin, Muhamad Amin bin Haji AbGhani, MohdNorazmi bin Nordin (2021). Unique Attitude? The Concept Of Special Education Leadership. *Turkish Journal of Computer and Mathematics Education* Vol.12 No.11 (2021), 5192-5196
- [27] Mohd Noh, A. N., Razzaq, A. R. A., Mustafa, M. Z., **Nordin, M. N.**, Ibrahim, B. (2021). Sustainable Community Based Ecotourism Development. *PalArch's Journal of Archaeology of Egypt / Egyptology*, 17(9), 5049-5061.
- [28] Mohd Noh, A. N., Razzaq, A. R. A., Mustafa, M. Z., **Nordin, M. N.**, Ibrahim, B. (2021). Elements of Community Capacity Building (CCB) For Cbet Development. *PalArch's Journal of Archaeology of Egypt / Egyptology*, 17(9), 4970-4981.
- [29] Mohd Noh, A. N., Razzaq, A. R. A., Mustafa, M. Z., **Nordin, M. N.**, Ibrahim, B. (2021). Future Community-Based Ecotourism (CBET) Development. *PalArch's Journal of Archaeology of Egypt / Egyptology*, 17(9), 4991-5005.
- [30] MohdNorazmi Bin Nordin, Mohamad Zaid Bin Mustafa, Badaruddin Bin Ibrahim, Abdul Rasid Bin Abdul Razzaq, Nor FauziyanaBintiMosbiran (2021). Special Education Unique Leadership Style: The Concept. *LINGUISTICA ANTVERPIENSIA*, 2021 Issue-1: 2244-2261
- [31] Muhamad Amin bin Haji AbGhani, AbidahAqilahBintiMohd Noor, Zulfadli Bin MohdSaad, MohdMazhanTamyis, MohdNorazmi bin Nordin (2021). Improving The Writing Skills Of Jawi Connection Letters Of Students With Learning Disabilities Using The Finger Step. *Turkish Journal of Computer and Mathematics Education* Vol.12 No.11 (2021), 5307-5312
- [32] Mustafa Kamal AmatMisra, NurhanisahSenin, Abdull Rahman Mahmood, JaffaryAwang, MohdNorazmi bin Nordin (2021). Analysis OnAshācirah And Ibādhiyah On The Attributes Of God. *Turkish Journal of Computer and Mathematics Education* Vol.12 No.10 (2021), 7661-7673
- [33] NazrahBintiJamaludin, KwayEng Hock, EliaBintiMd Zain, NorkhafizahbintiYussuf, MohdNorazmi bin Nordin (2021). This Special Education Is Unique For Teachers, Students, Parents, Leaders And Organizations. *Turkish Journal of Computer and Mathematics Education* Vol.12 No.11 (2021), 5179-5183
- [34] Noel JimbaiBalang, Bong Lie Chien, MimiliaBinti Gabriel, NorHamidahBinti Ibrahim, MohdNorazmi bin Nordin (2021). Elements of Teacher Readiness In The Construct Of Special Education Teacher Workload In Malaysia. *Turkish Journal of Computer and Mathematics Education* Vol.12 No.11 (2021), 5269-5273
- [35] Nor Diana MohdIdris, JunaidahYusof, Fazli Abdul-Hamid, MuhamadHelmySabtu, MohdNorazmi bin Nordin (2021). Formation of Special Education Leadership Study Questionnaire Set That Influences The Task Load And Job Satisfaction Of Special Education Teachers In Malaysia. *Turkish Journal of Computer and Mathematics Education* Vol.12 No.11 (2021), 5319-5323
- [36] Nor FauziyanabintiMosbiran, Ahmad Faqih Ibrahim, Muhammad Yasin Omar Mokhtar, Muhamad Amin bin Haji AbGhani, MohdNorazmi bin Nordin (2021). Elements Of Welfare In Job Satisfaction Of Special Education Teachers In Malaysia. *Turkish Journal of Computer and Mathematics Education* Vol.12 No.11 (2021), 5264-5268
- [37] Nor FauziyanaBintiMosbiran, Mohamad Zaid Bin Mustafa, Badaruddin Bin Ibrahim, Abdul Rasid Bin Abdul Razzaq, MohdNorazmi Bin Nordin (2021). Teacher Competencies To Provide Effective Individual Education Plan For Students With

- Special Needs Hearing Problems: An Early Review. *Turkish Journal of Physiotherapy and Rehabilitation*; 32(3): 1617-1621.
- [38] Parimala A/P Palanisamy, SantibuanaBintiAbd Rahman, SitiAzuraBintiBahadin, Helvinder Kaur a/p Balbir Singh, MohdNorazmi bin Nordin (2021). Relationship Elements In Job Satisfaction Of Special Education Teachers In Malaysia. *Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021)*, 5254-5258
- [39] Quah Wei Boon, MohdFairuz Bin Mat Yusoff, NurhanisahBintiHadigunawan, FatinNabilah Wahid, MohdNorazmi bin Nordin (2021). A Review Of The Management Theory For Special Education Task Load Perspective. *Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021)*, 5234-5238
- [40] RohaniBintiMarasan, Andrew Lim Ming Yew, Dg. Norizah Ag. Kiflee @ Dzul kifli, ColoniusAtang, MohdNorazmi bin Nordin (2021). A Principal's Leadership Excellence Though Disposition of Attributes. *Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021)*, 5360-5371
- [41] RohanidabintiDaud, ShazaliJohari, Fazli Abdul-Hamid, Syahrul N. Junaini, MohdNorazmi bin Nordin (2021). Face and Content Validity For The Special Education Leadership (Integration) Questionnaire In Malaysia. *Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021)*, 5172-5178
- [42] RosziNaszariahNasniNaseri, Maryam MohdEsa, NorlelaAbas, NurulZamratulAsyikin Ahmad, RafidahAbdAzis, MohdNorazmi bin Nordin (2021). An Overview Of Online Purchase Intention Of Halal Cosmetic Product: A Perspective From Malaysia. *Turkish Journal of Computer and Mathematics Education Vol.12 No.10 (2021)*, 7674-7681
- [43] RosziNaszariahNasniNaseri, NurulZamratulAsyikin Ahmad, SharinaShariff, HarniyatiHussin, MohdNorazmi bin Nordin (2021). Issues And Challenges Of Online Shoppingactivities On The Impact Of Corona Pandemic :A Study On Malaysia Retail Industry. *Turkish Journal of Computer and Mathematics Education Vol.12 No.10 (2021)*, 7682-7686
- [44] SantibuanaBintiAbd Rahman, Helvinder Kaur a/p Balbir Singh, Albert Feisal@Muhd Feisal bin Ismail, SalsuhaidabintiSulaiman, MohdNorazmi bin Nordin (2021). Formation Of Special Education Leadership Study Interview Protocol That Affects The Task Load And Job Satisfaction Of Special Education Teachers In Malaysia. *Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021)*, 5313-5318
- [45] ShahrulHapizah Musa, EliaBintiMd Zain, MuhdZulkifli Ismail, HifzanBinti Mat Hussin, MohdNorazmi bin Nordin (2021). Something Important For Special Education In Malaysia. *Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021)*, 5211-5216
- [46] ShahrullizabintiSaharudin, SitiAzuraBintiBahadin, Helvinder Kaur a/p Balbir Singh, ShazaliJohari, MohdNorazmi bin Nordin (2021). The Single Predictor Of The Influence Of Headmasters Leadership On Special Education Teachers Job Satisfaction In Malaysia. *Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021)*, 5184-5191
- [47] SitiJamilahSamsuddin, Mazidahbinti Ali, Ashari Ismail, MohdSaifulkhair Omar, MohdNorazmi bin Nordin (2021). Elements Of Work Type In The Construct Of Special Education Teacher Workload In Malaysia. *Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021)*, 5259-5263
- [48] SumaiyahMohd Zaid, NurhananiCheRamel, Aidah Alias, Mohammad Fahmi Abdul Hamid, MohdNorazmi bin Nordin (2021). Virtual Learning Of Deaf Students: We Miss

- Pupils, We Hate Covid19. Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021), 5197-5201
- [49] SuzanaBasaruddin, MuhamadHelmySabtu, Azizan Arshad, Irma ShayanaBteSamaden, MohdNorazmi bin Nordin (2021). Elements Of Knowledge In The Leadership Construct Of Special Education Head Teachers In Malaysia. Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021), 5146-5150
- [50] SyahrulAnuar Ali, Khadijah binti Mustapha, Jalila J., Sofia Binti Elias, MohdNorazmi bin Nordin (2021). Financial Elements In Job Satisfaction Of Special Education Teachers In Malaysia. Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021), 5229-5233
- [51] TumisahbintiAkim, SitiAzuraBintiBahadin, Helvinder Kaur a/p Balbir Singh, Irma ShayanaBteSamaden, MohdNorazmi bin Nordin (2021). Elements Of Qualification In The Leadership Construct Of Special Education Headmasters In Malaysia. Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021), 5135-5140
- [52] Zarina Osman, SyahrulAnuar Ali, SalwatibintiSu@Hassan, Kothai malar Nadaraja, MohdNorazmi bin Nordin (2021). Special Education Leadership In Malaysia: A Review. Turkish Journal of Computer and Mathematics Education Vol.12 No.11 (2021), 5324-5328