Implementing Data Science techniques and essential in education enable output high-quality benefits [1]. A neural network is one technique that appears and used in educational data mining. The feature of the neural network is that it has the possibility to uncover all probable interactions between predictor’s variables [2]. Greer et al applied visualization methods to characterize a useful pattern in educational data, which might not be clear for teachers working with using conventional statistical approaches [3].

AKGÜN et al proposed prediction of elementary teacher candidate of education by using artificial neural networks (ANN) technique to achievements in “Science and Technology Education” courses, and to show the independent variables importance in the prediction, the prediction results show a good specifically for social sciences, also in the prediction of academic performance and achievement [4].

Fumiya Okubo et al used the Recurrent Neural Network technique to predict student’s performance, for final grade by the log data that stored in the educational systems, a dataset contents of 108 student’s, used parameters of RNN that trained by Backpropagation through time, achieve that RNN accuracy is above 90% [5].

BAHADIR proposed two different neural networks used for prediction; in first one used the outcome of mathematics courses, that used as an input for the back-propagation algorithm, the second one uses the scores of all courses, the results show that the back-propagation neural network BPNN model offers comparatively accurate predictions for the student successfully, where an accuracy for the first Neural Network was 77% and for second was 69% in graduate education [6].

In study ARSAD et al presented a model of Neural Network that used to measure the academic achievement of CGPA, for the first semester of the Electrical Engineering Faculty, for two different entries, showed the model measured by using the Mean Square Error (MSE) and coefficient of correlation R. The results showed the effectiveness of the CGPA satisfactory results by using Neural Network model to predict the performance of students [7].

In [8] ARORA et al used classification techniques in order to improve the students’ academic performance, and the possibility to detect of success and failing students used hybridized fuzzy neural network model considers with some factors the result shows that the model outperforms statistical models and traditional back-propagation neural networks.

CHUNQIAO et al presented a model for forecasting student study through early warning for failure student, based on the TensorFlow platform and Python language used four variables, the result that obtained that the neural network model is a robust and dependable tool to predict student study unsuccessful risk [9].

Nusrat Mubin et al considered classification technique by Convolutional Neural Networks CNN to classify the person’s facial image (visual recognition), used this technique of Face recognition of a dataset that contained a number of facial images that taken of 200 students. The results showed the suitability of using this method that gives precision comparing and higher accuracy [10].

In [11] Pin et al applied classification technology, to classify the data in the granularity field basis of the Convolutional Neural Networks, The method proposed a high-performance classification of data with a granularity field, and obtained accuracy 89% by testing the data and 93% accuracy in real-world data test, this method applied in three banks in China which gave satisfactory results.

Liu P et al used a recursive neural network to text classification task and learn multiple related tasks as multiple purpose learning framework, proposed different information sharing mechanisms to simulate texts with shared layers and task-specific [12].

Gang et al proposed an integrating deep convolutional neural network set of comparative tests, to investigate the influence of performing of eye state classification, by used parameters of model variation and using different videos captured for students as data, that applied the AdaBoost algorithm, to get good performance for drowsy student state detection [13].

SMITH et al applied a deep neural network for diagrammatic student models as deep learning, suggests that it can to evaluation and predict student performance, concluded that the deep-learning approach was most accurate and they outperformed this model the other models [14].

In [15] Jena and Ananta Kumar proposed a neural network artificial intelligence NNAI for examining the misconception case of the participants for (forty students), on the retention and achievement in science learning. They found that statistically significant in the difference between a mean of posttest and pre-test score, in addition, that can use NNAI for humanities and social studies, and use the model to the teaching-learning process.

FOK BAHADIR in their investigation tried to explain how can use Tensorflow for deep learning and artificial intelligence in a prediction model, by using a dataset of two thousands instances, divided to training data by 75% and 25% used as the testing data, that could to determine the factors affecting the accuracy of the prediction model and solving a classification problem with prediction of non-linear results, achieved highest prediction accuracy between 80% to 91% [16].

In [17] Qiu et al proposed the dropout prediction model based on convolutional neural networks with dataset contains 39 courses, their results are comparable to other dropout prediction methods, a dataset contains of 39 courses information on the MOOC platform about 79,186 students took part as a log file in that course to get a good result for the model.

SUN et al used deep learning method to uncover emotion in e-learning system, depended on the convolutional neural network, by using facial expression; three types of databases are used for training and testing the model [18].

In [19] BAHADIR et al examined the Artificial Neural Network and Logistic Regression Analysis to prediction teachers’ of mathematics academic success, the dataset was 372 students for a model, the back-propagation neural network got the best result by 93.02% better than LRA 90.75%.

CHAMATKAR et al combined neural network with the three algorithms, these algorithms are prime k rules mining, allure Algorithm, and CM unsolicited mail Algorithm. The exceptional datasets of Amazon and (Flipkart) online e-commerce internet site that used to training and a testing dataset of the neural network. The result of all three algorithms with approaches of neural community, which time and memory difficulty not absolutely depend on the total of the input dataset [20].

References

[1] KLAŠNJA‐MILIĆEVIĆ, Aleksandra; IVANOVIĆ, Mirjana; BUDIMAC, Zoran. Data science in education: Big data and learning analytics. Computer Applications in Engineering Education, 2017, 25.6: 1066-1078.‏

[2] G. Gray, C. McGuinness, P. Owende, An application of classification models to predict learner progression in tertiary education, in:Advance Computing Conference (IACC), 2014 IEEE International,IEEE, 2014, pp. 549–554

[3] Greer, Jim, and Mary Mark. "Evaluation methods for intelligent tutoring systems revisited." International Journal of Artificial Intelligence in Education 26.1 (2016): 387-392.‏

[4] AKGÜN, Ergün; DEMIR, Metin. Modeling Course Achievements of Elementary Education Teacher Candidates with Artificial Neural Networks. Online Submission, 2018, 5.3: 491-509.‏

[5] Fumiya Okubo, Takayoshi Yamashita, Atsushi Shimada, Hiroaki Ogata, A Neural Network Approach for Students’ Performance Prediction, LAK 2017, pp.598-599, 2017.3.

[6] BAHADIR, Elif. Prediction of Prospective Mathematics Teachers’ Academic Success in Entering Graduate Education by Using Back-propagation Neural Network. Journal of Education and Training Studies, 2016, 4.5: 113-122.‏

[7] ARSAD, Pauziah Mohd, et al. A neural network students' performance prediction model (NNSPPM). In: 2013 IEEE International Conference on Smart Instrumentation, Measurement and Applications (ICSIMA). IEEE, 2013. p. 1-5.‏

[8] ARORA, Nidhi; SAINI, J. R. A fuzzy probabilistic neural network for student’s academic performance prediction. International Journal of Innovative Research in Science, Engineering and Technology, 2013, 2.9: 4425-4432.‏

[9] CHUNQIAO, Mi; XIAONING, Peng; QINGYOU, Deng. An artificial neural network approach to student study failure risk early warning prediction based on TensorFlow. In: International Conference on Advanced Hybrid Information Processing. Springer, Cham, 2017. p. 326-333.‏

[10] ARA, Nusrat Mubin; SIMUL, Nishikanto Sarkar; ISLAM, Md Saiful. Convolutional neural network approach for vision based student recognition system. In: 2017 20th International Conference of Computer and Information Technology (ICCIT). IEEE, 2017. p. 1-6.

[11] WU, Pin, et al. Convolutional Neural Network Based Structured Data Field Granularity Classification Method. In: IOP Conference Series: Materials Science and Engineering. IOP Publishing, 2018. p. 012033.‏

[12] Liu P, Qiu X, Huang X. Recurrent neural network for text classification with multi-task learning[C]// International Joint Conference on Artificial Intelligence. AAAI Press, 2016:2873-  
2879.

[13] Zhao, Gang, et al. "Deep convolutional neural network for drowsy student state detection." Concurrency and Computation: Practice and Experience 30.23 (2018): e4457.‏

[14] SMITH, Andy, et al. Diagrammatic student models: Modeling student drawing performance with deep learning. In: international Conference on User modeling, adaptation, and Personalization. Springer, Cham, 2015. p. 216-227.‏

[15] Jena, Ananta Kumar. "Predicting learning outputs and retention through neural network artificial intelligence in photosynthesis, transpiration and translocation." Asia-Pacific Forum on Science Learning & Teaching. Vol. 19. No. 1. 2018.‏

[16] FOK, Wilton WT, et al. Prediction model for students' future development by deep learning and tensorflow artificial intelligence engine. In: 2018 4th International Conference on Information Management (ICIM). IEEE, 2018. p. 103-106.‏

[17] Qiu, Lin, et al. "Student dropout prediction in massive open online courses by convolutional neural networks." Soft Computing (2018): 1-15.‏

[18] SUN, Ai, et al. Using Facial Expression to Detect Emotion in E-learning System: A Deep Learning Method. In: International Symposium on Emerging Technologies for Education. Springer, Cham, 2017. p. 446-455.‏

[19] BAHADIR, Elif. Using Neural Network and Logistic Regression Analysis to Predict Prospective Mathematics Teachers' Academic Success upon Entering Graduate Education. Educational Sciences: Theory and Practice, 2016, 16.3: 943-964.‏

[20] CHAMATKAR, Aruna J.; BUTEY, P. K. Implementation of Different Data Mining Algorithms with Neural Network. In: 2015 International Conference on Computing Communication Control and Automation. IEEE, 2015. p. 374-378.‏