7.0 SUMMARY

This research work aimed at developing an effective self-regulating e-Learning framework, and experiments were carried out in order to identify determinant factors and driving forces that will address problems faced in e-Learning systems today. The first experiment involved identifying key factors that will promote self-regulating behavior among online students by way of adopting different learning strategies. Principal Component Analysis technique was carried out on Self-Regulating Survey responses collected from undergraduate students using IBM SPSS Statistics. The outcome of the experiments revealed determinant factors on self-regulation which can be considered for any futuristic building and assessment of e-Learning Portals.

The second experiment was carried out by performing sentiment analysis on the student feedback on couple of e-Learning portals. The experiments involved constructing a sentiment tree for a sentence extracted from student feedback and also using N-Gram analysis, and Word cloud generation. These experiments revealed that there are varying sentiments and feedback from the online users on how they use or like the contents, methodologies. The experiment also expressed the needs which have to be taken in to consideration. Thus, this work confirms that the online course and portal designers should consider sentiments of the users apart from collecting the traditional feedback.

The third experiment was carried out by performing the web usage pattern analysis using Google Analytics software. Interesting user behavior patterns were presented as charts. So, there exists a need to utilize a proper analytics report which can provide the flow of the usage of the portal, the time spent by the students (online users) and the days when they were actively using the sites. This
would provide the indication and inference about the active usage and the reasons for inactive pages, so that corrective actions can be made.

The fourth experiment was carried out by performing Exploratory factor analysis using IBM SPSS and Confirmatory factor analysis using IBM AMOS on student responses related to usage of social networking site like LinkedIn in order to identify the key factors that could promote social networking site usage by students with the aim of improving the students’ academic and social standings. The outcome of the experiment was a good model fit for the theoretical model proposed and identification of critical factors that promotes students to access social networking sites for fulfilling educational and professional goals. This research also confirms that effective use of E-Learning can be improved by identifying the hidden factors related to student engagement and retention. The hidden factor like lack of timely intervention from faculty and many others were also applying ANOVA on MOOC performance data collected from public domain ‘Dataverse’. Based on the results, this research work infer that frequent notifications or updates are expected by the students from the online site either manually or through some automatic methods like email. Based on the case studies, data analysis and the results, it has been identified that single faculty model is not very effective and the users are expecting multiple faculty collaboration and support for the same course. The final experiment was carried out on Multi-faculty model with student performance analysis using ANOVA.

This research work addressed problems faced in e-Learning systems today and contributed to knowledge addition in e-Learning Research by evolving an effective e-Learning Framework that works on the Multi-Faculty Model. This work also identified critical factors that drive success in e-Learning Portals, namely, Faculty Empowerment, Self-Regulated Learning, Faculty-Student
Interaction, Sentiment Analysis of student feedback and automatic collection of web usage data. The Opinion Mining and Sentiment Analysis of Student Feedback reported positive about the experimental website and it helped to understand the learning needs, preferences and expectations of students. The automatic collection and analysis of web usage data provided interesting patterns of students learning behavior and learning needs. This helped the faculty to periodically improve the content of the website.

The Exploratory and Confirmatory Factor Analysis of student responses helped to identify the critical factors to a greater extent. Important factors that promote student empowerment in online social networking sites were identified, namely, Expert Opinion Seeking, Networking with contacts, and Notifications. These are the driving forces which show a path to students to enhance their academic and social status by networking with peers, faculties and Professional Experts. This research work also contributed to e-Learning research by developing a Multi-Faculty Self-Regulating e-Learning Framework. Online courses hosted with Multi-Faculty enrollment and collaboration empirically proved to be more effective when compared to other e-Learning Frameworks discussed in this work. Timely interventions based on continuous monitoring, helped students to become self-directed, and improve their learning outcomes.

The five pillars for the success of the Multi-Faculty e-Learning Model are Students, Faculty, Educational content, Stakeholders, and Technology Providers. The important application and outcomes of this research work suggest that Faculties should act as Instruction Designers, Facilitators of learning and support the stakeholders for designing and implementing e-Learning portals. Stakeholders should arrange faculty training in current e-Learning technologies to enhance the active participation and collaboration with the students. The assessment of the
value and effectiveness of e-Learning systems or any information system can be realized only from multiple quality factors. The important determinant factors that are critical are:

1) Self-Regulation
2) Faculty-Student Interaction
3) Continuous Improvement
4) Service Quality
5) System Use
6) User’s Satisfaction
7) Social Media and eWOM Communication
8) Usability
9) Perceived Usefulness
10) Perceived Ease-Of-Use
11) Multi-Faculty Collaboration

The statistical analysis like principal component analysis and confirmatory factor analysis carried out on social media collaborations and periodic interventions improved the student engagement. It is equally important to not to exclude any of these critical parameters. If any of these parameters is excluded which may affect the result of e-Learning system outcomes. This research has also confirmed that the single faculty model does not support e-Learning systems effectively whereas the experiments and case studies proved that multi-Faculty model improves the effectiveness significantly.

There is a significant improvement in learning outcomes in multi-faculty online e-Learning portals due to online effect and faculty effect. The metric used in measuring learning outcome are student grades and it has been experimentally proved the mean score significantly improved in a multi-faculty environment than
a single faculty environment. Therefore, the inclusion of the proposed considerations and adoption of multi-faculty model would make the eLearning effective.

The experimental studies and result on MOOC performance analysis helped for evolving an effective e-Learning Framework on a global scale for application of Multi-Faculty Model taking into account on critical factors identified such as Self-Regulation, Faculty-Student interaction, Sentiment Analysis of students’ responses and feedbacks. The web usage pattern analysis also helped faculties to improve instruction design and website improvements towards achieving the above goal. Social networking analysis helped how a multi-faculty model can be implemented by incorporating Collaborative tools like Discussion forums, chats, and Question Answering.