LIST OF FIGURES

Figure No.	Particulars	Page No.
1.1	Depicts the flow of courses from first year to third year of Civil Engineering Undergraduate Program.	16
1.2	Depicts the flow of courses from third year to fourth/final year of Civil Engineering undergraduate program.	17
1.3	Depicts the number of intakes, enrolled, passed, and placed E & T undergraduates	21
1.4	Depicts the number of intakes, enrolled, enrolled, passed, and placed civil engineering undergraduate program	23
3.1	Flow chart for process of data collection for the present study.	95
5.1a	Students mean achievement scores of Pre-tests and Post-test	194
5.1b	Students mean achievement scores of Pre-test Post-test and Delayed Post-test.	196
5.2	Students' performance in development of technical writing skills in project report writing for project practicums	198
5.3	Students' performance in development of soft skills in group project presentation	199
5.4	Site supervisors rating for clarity in understanding project practicum	201
5.5	Supervisor rating for students on identifying relevance of technical content in project practicums	202
5.6	Site supervisors rating for understanding and logically organizing the project practicums	203
5.7	Site supervisors rating for defining the concept of problems and questions in a logical and workable way.	204
5.8	Site supervisors rating for analyzing, developing, and proposing solutions for the project practicum problems	205
5.9	Site supervisors rating for students' effectiveness in evaluating and proposing solutions for the project practicum problems.	206

Figure No.	Particulars	Page No.
5.10	Site supervisor rating for students' demonstration for respect and integrity in teamwork for the project practicums.	207
5.11	Supervisor rating for openness and working productively as team member for project practicums	208
5.12	Site supervisors rating for students' effort in doing fair share of contribution as a team member for project practicums	209
5.13	Site supervisors rating for students' ability in focusing and pulling together ideas as a team member for project practicums.	210
5.14	Site supervisors rating for students understanding the technical content and site scenarios for project practicums.	211
5.15	Site supervisors rating for students' confidence developed in acquired skills project practicum	212
5.16	Students rating for their clarity in understanding, discussing, and presenting technical content of project practicums.	216
5.17	Students rating for synchronizing and identifying relevance of technical content to project practicums.	217
5.18	Students rating for understanding and logically organizing the technical content of project practicums and project presentations.	218
5.19	Students rating for their clarity in understanding, discussing and technical writing of project reports of conducted project practicums.	219
5.20	Students rating for their ability to synchronize and identifying relevance of technical material to the project practicums.	220
5.21	Students rating for understanding and logically organizing the technical writing for project practicums reports.	221

Figure No.	Particulars	Page No.
5.22	Students rating for correctly using grammar for construction of sentences for technical writing for project practicums reports.	222
5.23	Students rating for defining and conceptualizing the problems and challenges while conducting project practicums.	223
5.24	Students rating for breaking down the questions in a critical way for significant and productive discussions with supervisors for project practicums.	224
5.25	Students rating for understand and validates learning discussions with peers and supervisors for project practicums.	225
5.26	Students rating for builds relationships and demonstrates respect with peers and supervisors for project practicums.	226
5.27	Students rating for openness and work productively with different perspective in a team for project practicums.	227
5.28	Students rating for contributing fairly to sharing teamwork while conducting project practicums.	228
5.29	Students rating for students pulling ideas, focusses and drawing conclusions during teamwork for project practicums	229
5.30	Students rating for students understanding skills for technical content of project practicums.	230
5.31	Students rating for the quality of overall experience during PBL based internship program.	231
5.32	Students rating for students' responses for the impact of attended field experience on clarifying student's career plans and goals.	232
5.33	Students' responses for new technical skills students acquired because of PBL based internship program experience.	233
5.34	Students' responses for the project related or personal accomplishments after conducting project practicums for PBL based internship program.	234

Figure No.	Particulars	Page No.
5.35	Students' responses for the benefits of curriculum courses in preparing them for PBL based internship program experience.	235
5.36	Students' responses for the equipment, tools or software applications that were learned during PBL based internship program	236
5.37	Students' responses for the learning experience were different from the traditional classroom learning for PBL based internship program.	237
5.38	Students' responses for applying classroom learned theoretical concepts as applied during PBL based internship program practicums	238
5.39	Students' responses for the best learning aspect of this experience of attended PBL based internship program.	239
5.40	Students' responses for their post site visit inquiries as more technically specific and detail oriented for the project practicum.	243
5.41	Students' responses for identifying the safety violation for the ongoing construction site activities during post site visit.	244
5.42	Students' responses for the reflectiveness of gained field knowledge during conducting site visit.	245
5.43	Students' responses for familiarity and confidence during the post site visit in reading and interpreting construction drawings.	246
5.44	Students' responses for relevancy in identifying the different construction activities during post site visit for PBL based internship program.	247
5.45	Students' responses for extent in agreeing that exposure and practical skills acquired through conducted project practicums.	248

Figure No.	Particulars	Page No.
5.46	Students' responses for confidence in study area of interest during post site visit gained during conducting project practicums	249
5.47	Students' responses for relevancy of experience gained while conducting post site visit.	250

Picture No.	Particulars	Page No.
4.1	Site Plan - Example (Source-Wikipedia)	117
4.2	Students taking measurements and investigating on existing utilities at the site.	122
4.3	Students taking measurements and investigating on existing utilities at the site.	122
4.4	Site plan drawn by students per assigned project practicums.	124
4.5	Site plan drawn by students per assigned project practicums.	124
4.6	Students working for ground investigation worksheet per assigned project practicums.	125
4.7	Students working for ground investigation worksheet per assigned project practicums.	126
4.8	Types of excavators	131
4.9	Backhoe loader - excavator	131
4.10	Bulldozer - excavator	132
4.11	Motor Graders - excavator	132
4.12	Crawler loaders - excavator	132
4.13	Scrapers - excavator	133
4.14	Students interacting with team members and site supervisors for excavation field practicum	135
4.15	Students interacting with team members and site supervisors for excavation field practicum	135

4.16	Students interacting in a group as team members and monitoring excavation field practicum under the supervision of site supervisors.	136	
4.17	Students interacting in a group as team members and monitoring excavation field practicum under the supervision of site supervisors.	136	
4.18	Students interacting in a group as team members and monitoring excavation field practicum under the supervision of site supervisors.	136	
4.19	Students interacting in a group as team members and monitoring excavation field practicum under the supervision of site supervisors.		137
4.20	Students interacting with team members and Gujarat Engineering Research Institute (GERI) engineers while conducting assigned project practicums.		143
4.21	Students interacting with team members and Gujarat Engineering Research Institute (GERI) engineers while conducting assigned project practicums.		143
4.22	Students interacting with team members and Gujarat Engineering Research Institute (GERI) engineers while conducting assigned project practicums.		144
4.23	Students discussing and interacting with team members and site supervisors for the foundation design plans for assigned project practicums.		144
4.24	Form work for buildings		147
4.25	Typical Bar Bending Schedule- example		149
4.26	Batch Concrete Mixers		154
4.27	Non-Tilting Drum Mixers		154
4.28a	Reversing Drum Mixers		155
4.28b	Pan Type Concrete Mixers		155
4.29	Continuous Concrete Mixers		155
4.30	Concrete mixing transport trucks.		156
4.31	Students discussing and monitoring RCC Foundations Construction drawings.		159

4.32		
1.32	Students discussing and monitoring RCC Foundations Construction	159
4.33	Students discussing and monitoring reinforcement bar bending practicums.	160
4.34	Students discussing and monitoring reinforcement bar bending practicums.	160
4.35	Students observing and monitoring the excavated area for reinforcement design of foundation construction	160
4.36	Students monitoring the reinforcement bars mesh as laid per steel reinforcement. drawings.	161
4.37	Students monitoring the concrete pouring project practicum.	161
4.38	Students observing and monitoring building construction practicum as per building design drawings.	166
4.39	Students discussing and monitoring reinforcement bar bending practicums.	167
4.40	Students discussing and monitoring ready mix concrete batch plant practicums.	167
4.41a	Precast Concrete Frame Construction - example	171
4.41 b	Precast Concrete Wall Construction example	172
4.42	Precast Concrete Floors -example	173
4.43	Students working on the precasting mold for a precast unit at the Precast manufacturing plant for assigned project practicums	175
4.44	Students working on the precast mold for a precast unit at the Precast manufacturing plant for assigned project practicums.	176
4.45	Students worked and prepared precast mold for a precast unit at the Precast manufacturing plant for assigned project practicums.	176
4.46	Students worked and prepared precast mold for a precast unit at the Precast manufacturing plant for assigned project practicums.	177
4.47	Primavera software tutorial - example	184
4.48	Students discussing and interacting with team members and site supervisors for assigned project practicums.	186

4.49	Students interacting with team members and site supervisors while conducting assigned project practicums.	186
4.50	Students interacting with team members and site supervisors while conducting assigned project practicums.	187
4.51	Students interacting with team members and site supervisors while conducting assigned project practicums.	187
4.52	Students discussing and interacting with team members and site supervisors for the foundation design plans for assigned project practicums.	188
4.53	Students interacting with Civil engineering field knowledge expert for challenges and discussing to develop problem solving skills for construction management practices for the assigned project practicums.	188

LIST OF TABLES

Table No.	Particulars	Page No.
1.1	Typical Sequencing Plan for Courses at UG E&T Degree Program	14
1.2	Revised curriculum structure by AICTE for Engineering and Technical Undergraduate Engineering Program per revised AICTE curriculum.	15
1.3	Data collected by AICTE for Intake, Enrolled, Passed and Placed E & T Undergraduates for academic years from 2014 to 2017.	20
1.4	Data collected by AICTE for of Intake, Enrolled, Passed, and placed civil engineering undergraduates for academic years 2014 to 2017.	22
4.1	Representation of Implementation pattern of developed project practicums of present study.	112
4.2	Detailed schedule of sample students' groups for conducted project practicums for present study.	113
5.1	Objectives of the study, type and nature of data, data collection and analyze the implementation of present study.	191
5.2	Nature and tools of data collection for present study or PBL based internship program.	192
5.3	Scores obtained by sample students for pre-test and post-test PBL based Internship program.	194
5.4	Scores obtained by the sample students for pre-test, post-test and delayed post-test.for PBL based internship program.	195
5.5	Analysis of development in technical writing skills for project practicums.	197

5.6	Students' performance for the delivered project presentations for conducted project practicums.	198
5.7	Analysis of site supervisors' feedback for the developed and improved soft and technical competency skills.	200
5.8	Analysis of students' feedback for the developed and improved soft and technical competency skills.	215
5.9	Illustrates the students feedback responses for experience in attending PBL based internship experience.	232
5.10	Illustrates the student's responses on new technical skills students for conducted project practicums	233
5.11	Illustrates the students' feedback for the learning accomplishments after conducting PBL based internship period.	234
5.12	Illustrates the students' feedback on ways curriculum courses were beneficial in PBL based internship program.	235
5.13	Illustrates the students' feedback for the learning about equipment, tools, or software applications during PBL based internship program.	236
5.14	Illustrates the feedback for learning during the field experience was different from the traditional classroom learning.	237
5.15	Illustrates the feedback responses received for the theoretical concepts applied during your internship program.	238
5.16	Illustrates the students feedback responses for the best learning aspect of this attended PBL based internship program's experience.	239

Table No.	Particulars	Page No.
5.17	Illustrates the students feedback responses for their post site visit inquiries for PBL based internship program.	243
5.18	Illustrates the students feedback responses for identifying the safety violation for ongoing construction site activities during post site visit.	244
5.19	Illustrates the students' feedback for reflectiveness of gained field knowledge during post site visit.	245
5.20	Illustrates the students feedback responses for familiarity and confidence during the post site visit.	246
5.21	Illustrates the students' feedback for identifying the different construction activities during conducting project practicums.	247
5.22	Illustrates the students' feedback in agreeing for exposure and practical skills acquired through conducted project practicums	248
5.23	Illustrates the feedback received for increase in confidence in study area of interest.	249
5.24	Illustrates the feedback received for relevancy of experience gained at post site visit.	250
6.1	Flow chart for process of data collected.	278