QUANTUM UNIVERSITY

Student Centric Methods

Annual Report on Problem Solving Methodologies

Academic Year (2018-2019)

ANNUAL REPORT

PROBLEM-SOLVING

LEARNING METHODOLOGIES

Academic Year (2018-2019)

Registrar
Quantum University

Problem Based Learning Methodologies

2018-2019

Problem-Based Learning (PBL) is an innovative educational approach that redefines the traditional classroom dynamic by placing students at the forefront of their learning experience. In this methodology, students actively engage in the learning process by tackling real-world, open-ended problems within collaborative group settings.

The essence of PBL lies in its emphasis on cultivating essential problem-solving skills. Instead of relying on traditional lecture-based instruction, PBL encourages students to delve into authentic challenges that mirror those they might encounter in their future careers. This hands-on approach not only deepens their understanding of the subject matter but also equips them with critical thinking, communication, and teamwork skills.

Central to PBL is the concept of student empowerment. By immersing themselves in collaborative group work, students take ownership of their learning journey. This not only enhances their motivation and self-directed learning skills but also fosters a sense of responsibility and independence. In this active learning environment, students become more than passive recipients of information; they become problem-solvers, applying theoretical knowledge to real-world scenarios.

Problem Solving Methods

- Technical Quiz
- Project Work and Demonstration
- Project Competition
- Research Paper Presentation/RIC Presentation
- Case Studies
- Hackathon-Problem Selection and Solving

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	2	Department of Computer Science & Engineering, Tech Pro Club	Workshop on Digital Marketing	Computer Lab/ Mr. Shahnawaz Khan	Web Drill Technologies	16/02/2018	27
	3	Genesis-QUIZ	Workshop on Cloud Computing for AWS	Ms. Anuradha Karlekar	Startup Solutions Architect	11/10/2018	24
	4	Department of Mechanical Engineering & Genesis	Workshop on "Drone Technology"	Mr. Anuj Sharma	Head of Engineering and Flight Operations, Johnnette Technologies	09/02/2019	56
	5	Department of Mechanical Engineering	Workshop on Fabrication of Water Rocket	B.Tech Seminar Hall, Mr. Vivek Kr. Sharma	Assistant Professor, QU	19/02/2019	25
	6	Department of Computer Science and Engineering	Future of Core Engineering	B.Tech Seminar Hall, Mr. Hem Singh Patle	Director GroKalp, Habit Coach author of 5 Minutes Magical Habits	16/02/2019	47
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	4	Department of Computer Science and Engineering	Technical Quiz on Machine Learning and Artificial Intelligence	Mini Auditorium	Quantum University	10/05/2019	77
Project Report	1	Department of Computer Science and Engineering	Project on Artificial Intelligence and Machine Learning	Mr. Rajat Sikka and Mr. Sushil Chandra	TCS	04/08/2018	53
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Activity Report
PROJECT WORK
2018-2019

1. Workshop on Innovative Ideas in Digital Film Making on 25/01/2018

The Department of Media Studies and Design, Quantum University organized a Six day's Workshop on "Innovative Ideas in Digital Film Making". Mr. Rochak Sahu, as the resource person, enlightened the sessions with his experience and knowledge, and the classes benefited 15 students. Digital filmmaking has revolutionized the way movies are produced, allowing filmmakers to explore new creative possibilities and achieve stunning visual effects. In the realm of digital filmmaking, Six Day's Innovative Ideas has emerged as a prominent player, pushing the boundaries of technology and storytelling. This report provides an overview of Six Day's innovative ideas in digital filmmaking. In this event 15 students took part.

Six Day's Innovative Ideas in digital filmmaking have significantly influenced the industry, pushing the boundaries of technology and storytelling. Their exploration of virtual production, AI-assisted previsualization, augmented reality integration, advanced motion capture, cloud-based collaborative workflows, and interactive storytelling has opened up new creative possibilities, improved production processes, and enhanced audience engagement. As the digital filmmaking landscape continues to evolve, Six Day remains at the forefront of innovation, driving the industry.

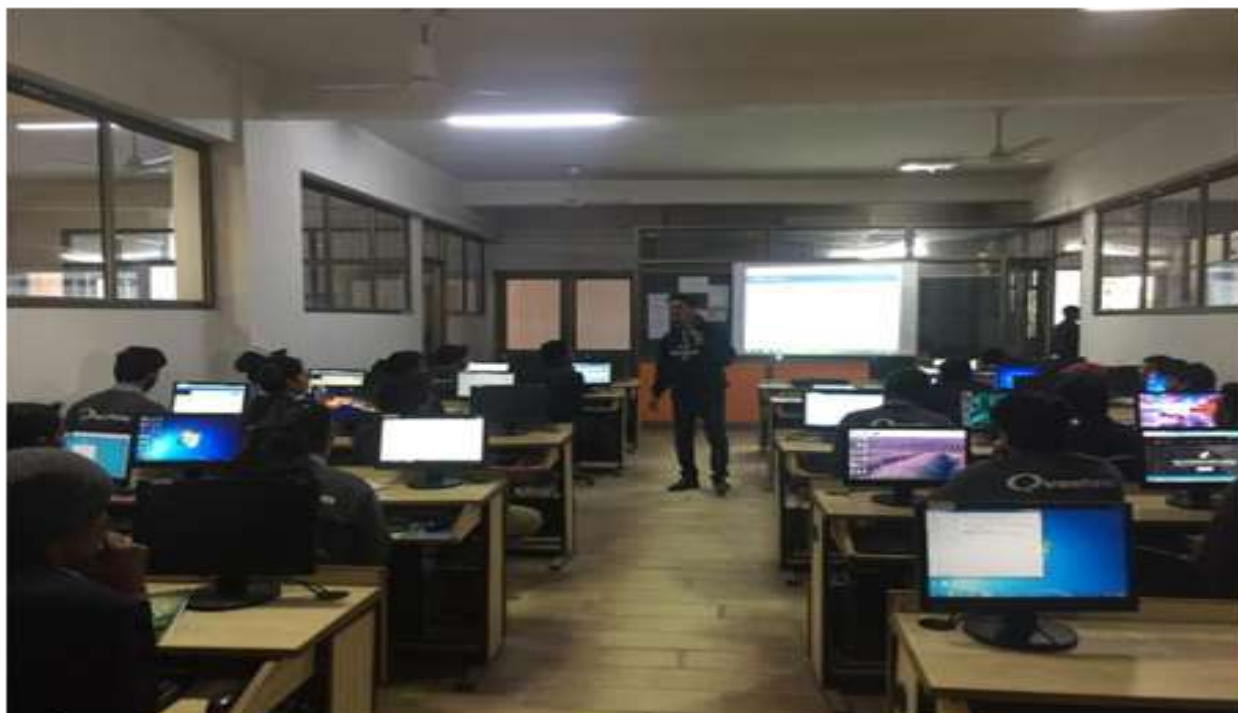**In Progress Innovative Ideas in Digital Film Making Workshop by Expert Mr. Rochak Sahu**

2. Workshop on Digital Marketing - 16/02/2018

The Workshop on "Digital Marketing" was held on **16th February 2018** at Quantum University and organized by the **Department of Computer Science and Engineering** & **Tech Pro Club** in association with the **Institution Innovation Council** for **CSE 1st and 2nd Year students** with a total strength of **27 attendees**. Mr. Shahnawaz Khan led the program from **Webdrill Technologies.**

Mr. Shahnawaz began by explaining the basics & importance of "Digital Marketing" in India and all over the World. The students were introduced to free domain sites to create their Websites. He Explained How digital marketing plays an important role in industries and other areas. He explained how other social sites make money through various Advertisements, and how it is affecting people in different countries.

He talked about various free domain sites where we can easily make our website and work on it. It is our own created website no other can make a website through our registered names. He also explained through digital marketing we can advertise businesses and other organizations.

Glimpses from the Digital Marketing Workshop done by Expert Mr. Shahnawaz (Webdrill Technologies)

3. Workshop on Cloud Computing for AWS - 11/10/2018

The Genesis Quantum University Innovation cell (QUIC) organized a workshop on Cloud Computing for AWS in collaboration with HeadStart Network Foundation and Startup Uttarakhand on 11th October 2018 for the students of MCA /BCA /BBA /LAW program of Quantum University to encourage exploratory engagement between start-ups, investors, and local governments and also to strengthen the start-up ecosystem in each state and explore business opportunities. In this event 24 students took part.

The event began with a warm welcome to all participants. An introduction to the speaker followed by Ms. Anuradha Karlekar, Startup Solutions Architect. Then Mr. Varun Tiwari – CEO, The Genesis Quantum University addressed the participants about the objective of the event. He turned the spotlight to the idea of creating platforms where new technologies, concepts, and business ideas are revealed and seen in a new light. He expressed his gratitude towards Headstart Network Foundation and Startup Uttarakhand of India for providing the required support for the event.

Image from Cloud Computing for AWS Workshop Held at Quantum University

4. Workshop on "Drone Technologies"- 09/02/2019

A workshop on "Drone Technologies" was organized by the Department of Mechanical Engineering, Quantum University, Roorkee. The guest speaker of the program, Mr. Anuj Sharma, Head of Engineering and Flight Operations, Johnnette Technologies, who is also an alumnus of the university, took over the session. In this event 56 students took part.

The guest explained the foundational knowledge about drone technology and its business applications. Drone technology can be used for personal, commercial, and security purposes. He said, "Drones are multifunctional". It's also used in artificial intelligence applications like emergency management, surveillance, and homeland security."

This workshop covered the introduction and fundamentals of aviation, drone electronics, assembly, and manual construction, drone prototyping, drone simulator training, stability and control, and flight testing. As we tried to bring Drone programming into the classroom for a better learning experience, we are sure our students got well trained with this technology.

A bright future in Drone Technologies is discussed during the workshop

5. Workshop on Fabrication of Water Rocket -19/02/2019

The Workshop on "Fabrication of Water Rocket" was held on 19th February 2019 at Quantum University and organized by the Department of Mechanical Engineering & Impulse Club in association with the Institution Innovation Council for the B.Tech students with a total strength of 25 attendees. The program was led by Mr. Vishal Kumar Sharma and Mr. Surinder Kumar (Assistant Professor, QU). The workshop was held to provide participants with hands-on experience in building and launching water rockets. The workshop aimed to foster creativity, problem-solving skills, and a deeper understanding of the principles of physics involved in rocketry.

Mr. M. Kannan began with an overview of water rockets, their history, and their applications. Participants learned about the basic components of a water rocket and the principles of thrust, aerodynamics, and stability.

Participants were introduced to different design considerations, including the selection of materials, rocket body shape, and fin design. They were then provided with the necessary materials and tools to construct their water rockets. Under the guidance of experienced instructors, participants engaged in the construction process, applying their knowledge and creativity to build their rockets. The instructors provided assistance, tips, and suggestions to ensure the rockets were well-constructed and safe. Safety guidelines were emphasized throughout the workshop to ensure participants' well-being. Topics such as launch site selection, pre-launch safety checks, and proper handling of water rockets were covered in detail.

The facilitator provided an overview of water rockets, their history, and their applications to the attendees

Images from Hands-on experience in building and launching water rockets

6. Future of Core Engineering on 16/02/2019

The Department of Computer Science and Engineering, Quantum University in collaboration with The Genesis – QU Innovation Council & Zeromonk successfully hosted an Online Webinar on "Future of Core Engineering" for students. A total of 47 students and faculty members participated in the session. The expert Mr. Hem Singh Patle, Director GroKalp, Habit Coach, and author of 5 Minutes Magical Habits commenced the session with an introduction to core engineering.

He showed that the way technology is changing in the 21st century and the way it has impacted engineering education, it is quite important to note how the inclination of students and also early-age professionals is shifting towards computer science.

There could be several reasons for that, including the development of emerging areas like Artificial Intelligence, Machine Learning, the Internet of Things, Data Science, Cyber Security, and a lot more, along with the lucrative career opportunities being offered in terms of monetary benefits.

At the same time, we also need to think that this inclination is somewhat creating a vacuum for the core engineering fields, because of which these fields are facing a shortage of great talents.

Participants Learning about the Future of Core Engineering

Event Report
Technical Quiz
2018-2019

1. Technical Quiz on 14/04/2018

On 14/04/2018, a technical quiz was organized by Er. Pushkar Kumar and Er. Hemlata Gururani, representing the SPARK Club, brought together 15 students from the Department of Computer Science and Engineering (CSE) branches. The quiz, centered on Basic Computer Science Engineering, aimed to test the participants' understanding of foundational concepts in these fields.

The event concluded on the same day, with Mr. Soyab from the Computer Science and Engineering (CSE) department (3rd Year) emerging as the winner and receiving the first prize of Rs 300. Mr. Parth Garg from CSE (2nd Year) secured the second prize, earning Rs 180.

This initiative not only fostered healthy competition but also provided a platform for students to showcase their knowledge and expertise in the realm of electrical and electronics engineering. The recognition of top performers through prizes added a competitive and rewarding element to the educational experience.

A figure from a Technical Quiz organized for engineering batch students at Quantum University

2. Basics of Automobiles on 24/02/2019

On 24/02/2019, Mr. Vivek Kumar Sharma conducted a valuable technical session for a batch of 41 students, enlightening them on the fundamentals of automobiles. During this session, students were introduced to basic terminologies commonly used in the context of vehicles.

Mr. Sharma's expertise allowed him to effectively communicate essential concepts, providing students with a foundational understanding of the mechanics and terminology associated with automobiles. This educational initiative contributes to the students' broader knowledge base, offering insights into an important aspect of engineering and technology.

The session likely served as a solid starting point for the students to explore and comprehend the intricacies of automotive systems.

Quantum University believes in laying the foundation for Technical Base for a bright future.

3. IEEE Day on 12/04/2019

IEEE Day was celebrated on 12th April 2019. It started with the cake-cutting ceremony which was done by the director Prof. Dr. Gulshan Chauhan. After that, he addressed the gathering of 25 students with his motivating and enthusiastic speech. He mentioned how the Quantum Engineering Student Branch can enhance its presence in the university. He suggested his ideas and thoughts on how the quantum IEEE strength can be increased.

Meanwhile, the branch counselor Mrs. Jaspreet Srivastava mentioned the events that have been conducted under IEEE and also about the future events that will be conducted on the campus under IEEE shortly which include one of the national conferences which are scheduled to be held soon. Before the event was brought to a close one video was played which included all the glimpses of the events that have been conducted under the Quantum Engineering Student. After that, the celebration was brought to an end followed by a photo session ceremony.

Quantum IEEE was done with a knowledge enhancement workshop on careers in Cloud Platforms.

4. Technical Quiz on Artificial Intelligence and Machine Learning -10/05/2019

On 10/05/2019, an engaging Technical Quiz on Artificial Intelligence (AI) and Machine Learning (ML) was conducted, recognizing these technologies as the backbone of modern system simulations.

The event showcased various applications and real-time examples through videos, providing students with practical insights into the dynamic field of AI and ML. The event actively involved the 77 participating students, fostering an interactive learning environment. The quiz included a questionnaire section, allowing students to demonstrate their understanding by clearing queries related to AI and ML.

The event not only served as a platform for theoretical knowledge but also encouraged hands-on engagement, aligning with the essence of these transformative technologies. Overall, the quiz successfully combined theoretical concepts with real-world applications, contributing to a comprehensive learning experience for the participants.

Image from Technical Quiz on Artificial Intelligence and Machine Learning

1. Project on Artificial Intelligence and Machine Learning – 04 /08/2018

With the abundance of data being generated every day, the rise of new automated technologies is inevitable. Artificial Intelligence and Machine Learning are among the newly introduced technologies. **To focus on the applications of AI & ML in Technology and Management a workshop was organized by the Faculty of Business and Management on August 04, 2018**.

The Guest Speaker of the workshop was Mr. Rajat Sikka and Mr. Sushil Chandra from TCS. The Workshop started with a welcome address by Prof.Pushpendra Singh, HOD-MBA.

Mr. Rajat Sikka and Mr. Sushil Chandra, the resource persons of the workshop addressed the gathering of 53 students and threw light on the role of Artificial Intelligence & Machine learning. The various Machine learning techniques have been briefed by them and a step-by-step demo on implementing the machine learning algorithms in Python using the real-time datasets was also discussed during the workshop.

Prof. (Dr.) Vivek Kumar, Hon'ble Vice-Chancellor of Quantum University also gave insights about the Role of AI & ML in Marketing and other subdomains of management. He also gave quality insights on neural networks etc.

AI & ML Technology is the New Career Avenue for Students

2. Bharat Pitchathon & The Investor Masterclass – 24/08/2018

Faculty of Business and Management, Quantum University successfully organized a **Bharat Pitchathon & the Investor Masterclass** on **August 24, 2018**. The event took place through **QU Innovation Council** in collaboration with the **Headstart Network Foundation** and **Startup Uttarakhand.**

Quantum University conducted the program in **two consecutive sessions. The first** event was the **Bharat Pitchathon** which was a great opportunity for all the young companies particularly start-ups seeking to raise a seed or investment capital. The event was a great platform for entrepreneurs to showcase their projects in front of potential partners and investors, a staggering strength of 123 students attended the program. The selected candidates would be offered financial aid and receive mentorship from a panel of experts. Secondly, there was **The Investor Masterclass** to acquaint the students with the basics of investing, starting businesses, and kickoff startups.

The event began with a warm welcome to all participants and high tea along with the registration process of all startups. It was followed by an introduction to dignitaries followed by a lamp lighting ceremony. **Prof. (Dr.) Vivek Kumar, Vice Chancellor - Quantum University** addressed the participants about the objective of the event. He turned the spotlight to the idea of creating platforms where new technologies, concepts, and business ideas are revealed and seen in a new light. He also mentioned how in this automation era innovation needs to be encouraged to live an advanced lifestyle. He expressed his gratitude towards Headstart Network Foundation and Startup Uttarakhand of India for providing the required support for the event.

A few Snapshots from the memory lane of Bharat Pichathon & the Investor Summit Endorsed by Quantum University and Genesis

3. Project report on Lean Start-up & Minimum Viable Product – 05/09/2018

Session on "Lean Start-up & Minimum Viable Product/Business"- Mentoring Session was held on **5ᵗʰ September 2018** at Quantum University in **Pre-incubation and incubation Cell (E102)** for **8 QUIC Startup (4 Established & 4 Early Stage)** with the following objectives:

· Mentorship for early-stage start-ups.

· Product/Business viability discussions

· Identification of methods for scaling the business

· Budget planning and approaches for being lean startups

Focused on MSME, **Mr. Varun Tiwari, CEO, of Intelligyan Edu Services Pvt. Ltd.** mentored the start-ups one by one a total of 17 members from different startups gained understanding by discussing the various aspects of the established and early-stage start-ups. Students discussed their ideas to expand and the methods to begin a lean start-up.

Queries were handled by Mr. Varun Tiwari and each start-up was given targets to achieve with a deadline.

Mr. Varun Tiwari mentoring students who are part of startups in the Quantum University

4. Innovation/Prototype Validation-Converting Innovation into a Start-up – 05/09/2018

The session on **"Innovation/Prototype Validation – Converting Innovation into a Start-up"** was organized by **The Genesis QUIC**, held on **5ᵗʰ September 2022** at Quantum University in Mini Auditorium for the First Year – BBA, B.Com, B.Sc., BJMC, D.Pharmacy students and faculties of the university with the following objectives:

· Develop a clear understanding of the stages involved from prototype development to conversion into a commercial startup.
· Converting innovative ideas into a Start-up.
· To evaluate how emerging entrepreneurs feel about a new product before its release.

Mr. Varun Tiwari, CEO, of Intelligent Edu Services Pvt. Ltd. started the session by addressing a gathering of 79 students with a hands-on example of the recent prototype converted into a startup named 'Nutrition- Adda'. The expert shared the entire journey of how they and their team converted an idea right from the ideation stage to a prototype and then from a prototype to an actual startup. The expert shared all the stages involved from prototype development to conversion into a commercial startup with the help of practical examples which ensured that the students could relate to the concept and understand the process of converting a prototype into a commercially viable startup.

Mr. Varun Tiwari, CEO, of Intelligent Edu Services Pvt. Ltd guiding students on the Prototyping and Validation of their products

5. One-day Project "Green Energy" – 20/09/2018

The Mechanical Engineering Department had organized a **One-day Project "Green Energy"**. The event served as a platform to build capacities in green energy and sustainable city planning including green and renewable energy options as well as challenges and opportunities for applying sustainability concepts in an economic, social, and environmental context.

The workshop was attended by 25 students and was led by Er. Rajiv Sharma, Er Harikrisna and Er. Sumit Katariya. The lecture focused on key topics including green transportation policies and planning; green infrastructure development; green and renewable energy; waste-to-energy; waste management; electric vehicles; power supply using biomass; and wastewater management.

The workshop was highly dynamic on "Renewable Energy" which enabled participants to explore in-depth knowledge related to green energy. The workshop concluded with a visit to the 110 KW solar power plant of Quantum University. The total strength was 25 and Students were B. Tech (ME) and BCA.

A Practical Insight for students who are keen to learn about Green Energy a Revolution in India