

Active Learning Framework for Python Programming

Renamala Lohith Kumar

Phd Scholar, Sr University

Abstract

In Outcome-Based Instruction, the Dynamic Learning technique is utilized to progress the learning of the understudies within the classroom. To upgrade the venture execution aptitude of the understudies, one of the Comprehensive Courses was presented to be specific "Programming in Python" for the undergrad understudies of the Office of Computer Science and Designing. In this course, understudies carry out an extent of the concepts learned amid the course. Dynamic learning presented in this course made a difference in the students to lock in within the execution of ventures, week-by-week surveys, and discussions with peers to actualize the concepts learned within the classroom. The dynamic learning system made a difference in the resources to audit and assess the extended work. The result of dynamic learning made a difference in the understudies to fathom the issues with extended strategies than learning programming developed.

Keywords: Comprehensive Course, Rubrics, Self- Study, Active Learning

Introduction:

Consolidating Learning(PBL)[1] strategies in venture advancement have made a difference in the understudies to soak up dynamic learning in a productive way. The preference of PBL is to supply a required learning environment conjointly create a project[2]. The challenges confronted amid the usage of PBL are examined by Marilyn et.al [3]. Checking the advance of ventures through appropriate communication with the understudies is more imperative than creating assessment rubrics. The key to victory in soaking up dynamic learning is adjusting the ancient techniques to your needs and making your claim procedure [4].

The current drift requests the utilization of Result Based Learning (OBL) to upgrade the instruction quality. In arrange to suit OBL, the course has been planned to help the interaction among understudies which gives a viable strategy to maximize their learning with dynamic support. Dynamic learning through the extent is one of the productive and commonly utilized procedures to advance OBL. The course is planned to supply adequate time separated from the contact hours to create ventures based on the concepts learned interior the classroom. Amid the improvement of the extent, understudies have taken inputs from the alumni/Industry Specialists [5].

Understudy learning has been improved through the execution of hypothetical concepts learned by them. The understudies can upgrade their learning experience by creating real-time applications based on the hypothetical concepts learned. The learning can happen interior the classroom, research facility, discourse with peers or resources, and more critically self-learning.

In this paper, the plan and appraisal plans for the course “Programming in Python” are examined. The choice to incorporate a self-study component within the comprehensive course was exceptionally unused to most of the resources. In each semester, two courses were chosen as a comprehensive course with six credits each, of which two credits were for the self-study component. It was nonstop travel with normal gatherings with all partners on a customary premise sometime recently the course began and amid the semester. Distinctive divisions were picked for a diverse technique to create utilize of self- ponder component but the Division of Computer Science and Building embraced dynamic learning through projects. The strategy and arrangement for the comprehensive course “Programming in Python” has been talked about in Segment 2. The assessment procedure received for dynamic learning through ventures has been examined in Area 3.

2. Methodology

The staff offers the arrangement of exercises for the understudies to carry out their ventures for the course "Programming in Python" at the beginning of the semester. The fundamental objective was to create the understudies to actualize the project's arrangement by organizing the course. Dynamic learning is the integration of knowing and doing [6]. Student's groups were shaped of estimate extending from 3-4 members and opportunity was given to choose the extended subject at first. The subject chosen had to be a real-time application. This real-time application made them not to download and yield the existing venture. Understudies' introduction towards collecting unused prerequisites and planning and creating as per the necessities was the most important motive. Reviews given by the faculty helped the understudies to complete their ventures within the right course and in a convenient way. Together with that, communication and introduction aptitudes of understudies were enhanced. During the survey preparation, the peers gave extra input to assist the advancement of the venture.

A. Plan

Beneath the self-study component of the “Programming in Python” course, understudies had to carry out extended work of creating a Web application or Database Application or Gaming application or Illustrations Application to investigate the viable applications of the concepts learned. Few ventures were too created for the advantage of office activities.

The arrangement of exercises appears in Table 1. The movement arranged was effectively connected in simple execution of the extend. Moreover, the online test was conducted through the Social Learning stage Wiksate [7].

Table 1: Project Development Plan Of Activities

Sl. No	Week	Probable Dates	Activity
1	1 st	08 th to 13 th Aug 2016	Formation of groups. Note: Student groups of size 3 or 4 within the same lab batch
2	2 nd and 3 rd	22 nd Aug to 03 rd Sep 2016	Project topic selection by each group
3	4 th	06 th Sep to 13 th Sep 2016	Presentation: Student and Project topic introduction by each group
4	5 th	19 th to 24 th Sep 2016	High level Design of the project (Design Layout)
5	6 th and 7 th	26 th Sep to 08 th Oct 2016	Presentation on Graphical User Interface of project by each group
6	8 th and 9 th	13 th to 27 th Oct 2016	Presentation of Back-end logic of the project by each group (Database Connection, Networking application, Gaming, Data Analytics, Design of table, etc.)
7	10 th	28 th Oct to 05 th Nov 2016	Complete Project Demonstration with Report

3. Programming In Python: Course End Survey And Rubrics For Project Evaluation Table 2 A depicts Course Results (CO) outlined for the “Programming in Python” course. CO5 is outlined in arrange to attain the higher level Program Results (PO) such as PO9 and PO10 additionally the CO-PO Mapping for Programming in Python course are delineated in Table 2B. The two strategies of appraisal for computing the CO achievement are coordinate and roundabout.

Table 2a: Course Outcomes For Programming In Python

CO1	Demonstrate the salient features of python.
CO2	Illustrate object oriented concepts using python programming.
CO3	Demonstrate database storage and retrieval in python.
CO4	Develop User-interface and graphics applications in python.
CO5	Design and develop interactive applications for a given real world requirements.

Table 2b: Co-po Mapping

CO-PO Mapping													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO1	2		3										
CO2	2		3										
CO3	2	2	3										
CO4	2	2	3										
CO5		2	3	3	2				3	3			

Table 3a: Course End Survey Rubrics

Course Code:15CS5DEPIP	Course Title: Programming in Python			
Criteria	Excellent	Good	Average	Poor
Are you able to develop python programs?	Able to develop python programs on any given concept.	Able to develop python programs on most of the given concepts.	Able to develop python programs on few concepts.	Unable to develop python programs.
Are you able to Illustrate object oriented concepts using python programming.	Able to Illustrate the entire object oriented concepts using python programming.	Able to Illustrate most of the object oriented concepts using python programming.	Able to Illustrate few of the object oriented concepts using python programming.	Unable to Illustrate object oriented concepts using python programming.
Are you able to demonstrate database concepts in python?	Able to demonstrate all the database concepts in python.	Able to demonstrate most of the database concepts in python.	Able to demonstrate few of the database concepts in python.	Unable to demonstrate the database concepts in python.
Are you able to develop User-interface and graphics applications in python?	Able to develop any User-interface and graphics applications in python.	Able to develop most of the User-interface and graphics applications in python.	Able to develop few of the User-interface and graphics applications in python.	Unable to User-interface and graphics applications in python.
Are you able to design and develop applications for a given requirements.	Able to design and develop any applications for a given requirements.	Able to design and develop most of the applications for a given requirements.	Able to design and develop few of the applications for a given requirements.	Unable to design and develop applications.

The coordinate evaluation is computed through the assessment of Persistent Inner Assessment (CIE) which comprises Hypothesis Tests, Quiz/Alternate Appraisal Instrument (AAT), and Research facility Component.

- The backhanded evaluation is done through Course Conclusion Overview (CES) after the semester. The CES questions are outlined to be mapped to the Course Results additionally CES rubrics are surrounded for assessment of the backhanded assessment as appeared within Table 3A.

Table 3c: Course End Survey Results (in %)

Course Outcome	Excellent	Very Good	Good	Satisfactory	Effective Attainment	Attainment
CO1	82	55	22	4	3.32	82.98
CO2	72	59	27	5	3.21	80.37
CO3	74	58	25	6	3.23	80.67
CO4	70	57	30	6	3.17	79.29
CO5	69	55	35	4	3.16	78.99

The comes about of Course Conclusion Overview both in rate and pie chart outlined in Table 3B and 3C. From the comparison CES comes about it is obvious that most of the understudies have given an “Excellent” rating which in turn reflects that dynamic learning is an effective strategy for instructing pedagogy.

Table 4 delineates the rubrics utilized for the assessment of the Python applications created by the understudies. The outside inspector was welcomed to assess the ventures to preserve reasonableness and straightforwardness. The quality of instruction was enormously upgraded through a dynamic learning strategy.

The abilities of the student were depicted all through the stages of the venture such as arranging, planning, actualizing, and introduction. In arrange to attain Program Results (PO) PO7 to PO12 such as deep-rooted learning, proficiency hone, and morals, dynamic learning was presented as a portion of self-study.

4. Challenges In Implementing Active Learning Through Projects For Programming In Python

- Taking after were the challenges confronted amid the usage of dynamic learning through ventures for Programming in Python course:
- Recognizable proof of the issue explanation which understudies can get it and actualize in stipulated time.
- Doling out Extend to the gather based on group size.
- Giving required assets (program, materials) to the understudies for creating projects.
- Adjusting the course substance to assist the understudy in memorizing the concepts speedier in executing the project.
- At first, the understudy found this approach exceptionally boisterous but based on convenient direction by staff facilitators they were able to acknowledge the unused approach of dynamic learning.
- The lesson instructor should provide the inputs or direction to the whole venture bunches in a course.

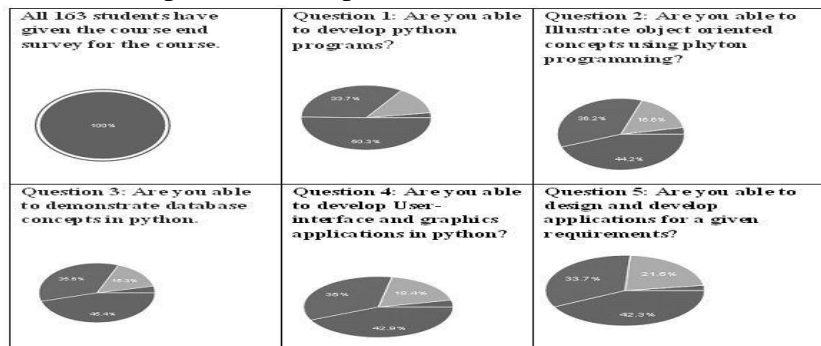


Table 3c: Course End Survey Results (Pie Chart)

5. Impact Of Active Learning In Python

Fig.1 shows the test questions surrounded in

the internals assessment and most of the questions were Analyze and Make the level of Bloom's Scientific classification [8]. Since dynamic learning was executed from the start of the course, understudies were able to reach fitting arrangements for the given issues. Fig.2 shows the execution of the understudies in CIE.

All the students' CIE mark dispersions run between 31-50 marks which reflects the effect of dynamic learning actualized in this course.

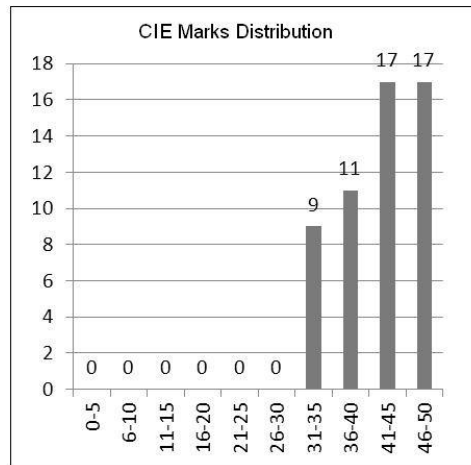
A. Affect of Active Learning on Other Courses

this understudy executed the ventures as a portion of the course within the fifth semester and the understanding of the programming develops of Python was reflected in higher semester courses like Fake Insights (AI), Information Science utilizing R, Enormous Information, and Analytics. The Artificial Intelligence course could be a comprehensive course within the educational modules of the 6th semester of Computer Science undergrad.

Criteria	Exemplary	Proficient	Partially Proficient	Points
Graphical User Interface (GUI)	(2) The project has an exceptional design, attractive and usable layout.	(1) The project has an attractive design and usable layout	(0.5) The project has a usable design layout, but may appear busy or boring.	2
Back-End Logic	(3) Background is exceptionally attractive, consistent, adds to the theme or purpose of the site, and does not detract from readability.	(2) Background is attractive, consistent, adds to the theme or purpose of the site, and does not detract from readability.	(1) Background is consistent and does not detract from readability.	3
Relevance	(1) All information provided by the student on the python project is relevant, Legal (if applicable) and all the requirements of the project have been met.	(0.5) Almost all the information provided by the student on the python project is accurate, legal (if applicable) and most of the requirements of the project have been met.	(0.25) Almost all of the information provided by the student on the python project is accurate, legal (if applicable) and few of the requirements of the project have been met.	1
Report	(2) Clear and Effective writing and adherence to appropriate style guidelines	(1.5) Writing that is clear and effective for the most part and minor errors in adherence to appropriate style guidelines	(1) Unclear and ineffective writing and multiple errors in adherence to appropriate style guidelines	2
Oral communication (presentation)	(1) Clear and effective communication	(0.5) communication is clear	(0.25) Unclear communication	1
Participation in Discussions	(1) Provided many good ideas; inspired others; clearly communicated ideas, needs, and feelings.	(0.5) Participated in discussions, on some occasions, made suggestions.	(0.25) Listened mainly; Rarely spoke up, and ideas were off the mark.	1
Total				10

Table 4: Project Evaluation Rubrics

Marks Distribution



The research facility works out of the AI course were outlined in such a way that understudies can type in the programs utilizing Python. The utilization of the research facility hours was to the complete degree as understudies can begin actualizing these works without the additional exertion of learning unused dialect structure. In this course as a portion of the self-study, the understudies created genuine life applications utilizing procedures of Counterfeit Insights. These applications were actualized utilizing Python. The students' solid foundation of programming developed in Python within the prior semester made them concentrate more on AI strategies than to concentrate on programming syntax. Moreover, dynamic learning in Python improved the students' capability to utilize progressed builds of Python Programming to bolster the improvement of AI applications.

Conclusion

In this paper, the plan and appraisal plans for the execution of dynamic learning for the "Programming in Python" course for undergrad understudies have been examined. The strategy and action arranged of the course talked about over gave the understudies appropriate arranging towards dynamic learning and completion of their ventures in time. The Assessment rubrics made a difference in the resources to assess the understudy ventures viably and fair-minded. The effect of dynamic learning made a difference in the understudies to concentrate more on the project techniques and ideas instead of learning programming development.

Reference

1. Hye-Jung Lee, and Cheolil Lim. "Peer Evaluation in Blended Team Project-based Learning: What Do Students Find Important?". *Journal of Educational Technology & Society* 15.4 (2012): 214–224. ISSN 1436-4522 (online) and 1176-3647 (print).
2. Tseng, Kuo-Hung, Chang, Chi-Cheng, Lou, Shi- Jer, Chen, Wen-Ping, "Attitudes towards science, technology, engineering and mathematics (STEM) in a project-based learning (PBL) environment", *International Journal of Technology and Design Education*, Springer, February 2013, Volume 23, Issue 1, pp 87-102, DOI:10.1007/s10798-011-9160-x.
3. Marilyn Rice, Li-Jen Shannon " Developing Project Based Learning, Integrated Courses from Two Different Colleges at an Institution of Higher Education: An Overview of the Processes, Challenges, and Lessons Learned", 2015 Proceedings of the EDSIG Conference, Wilmington, North Carolina USA.

4. B. S. Bell and S. W. J. Kozlowski, “Active learning: Effects of core training design elements on self-regulatory processes, learning, and adaptability,” *Journal of Applied Psychology*, pp. 296–316, 2008.
5. Syed Akram, S. Selvakumar, J. J. Lohith, B. R. Shambhavi, M. Indiramma (2014) “Role of industry to improve outcome based education in engineering” in *Journal of Engineering Education Transformations*, Special Issue: Jan. 2015, ISSN 2394-1707.
6. https://en.wikipedia.org/wiki/Project-based_learning
7. <https://www.wiksate.com/>