Effectiveness of Python Programming Training Programme Through Perceptions of Students Trainees

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Abstract

Center for Advanced Agricultural Science and Technology (CAAST) on Climate Smart Agriculture and Water Management (CSAWM) which is being implemented in Mahatma Phule Krishi Vidyapeeth, Rahuri under ICAR-World Bank aided National Agriculture Higher Education Project. Capacity building of faculties and scientist; and post graduate students of this university is one of the most important objective for implementation of CAAST-CSAWM. This study was conducted in Mahatma Phule Krishi Vidyapeeth, Rahuri during 2019-20 to assess effectiveness of python programming training programme through perceptions of student'strainees. Total 46 trained students were selected for the study. The study revealed that majority (89.13 per cent) respondents had middle age category, Ph.D. (56.52 per cent), OBC category (43.78 per cent), male (65.22 per cent). Majority (54.35 per cent) of the respondents were reported 'medium level' of perceived effectiveness for python training.

Key words : Python Programming Training, Perception, Students Trainees.

The Python programming language was created by Guido Van Rossum in 1989. It is an interpreter programming language developed as an open source project. Python supports object-oriented programming, procedural and also functional programming (Meszarosava, 2015). The language constructs enable the user to write clear programs on both a small and large scale (Dave, 2011).The most important feature in Python being it supports multiple programming paradigms, including object-oriented, imperative and functional programming or procedural styles. Python supports a dynamic type system and automatic (Srinath, 2017). It is used for example in web development, network administration, computer games programming, data processing and a number of programs has an integrated support for Python scripts *e.g.* Blender, Photoshop (Briggs,2012). It can be used on server to create web applications, alongside software, to create workflows, connect to database system. It can also read and modifying files. It can handle big data and perform complex mathematics. One of the major advantage of python is it work on different platforms like windows, linux, Raspberry Pi. etc. it having vast application in agriculture like estimation of various agriculture factors, forecasting climate change and variability estimation of crop yield etc. Keeping this in view, an attempt was made to ascertain the effectiveness of python programming training programme through perceptions of students trainees.

Research Methodology

The present study was conducted on the students from different disciplines of Mahatma Phule Krishi Vidyapeeth, Rahuri who attended the specialized training on Python Programming organized by center for advanced agriculture science and technology project on climate smart agriculture and water management, Mahatma Phule Krishi Vidyapeeth, Tah. Rahuri, Dist. Ahmednagar during 04th to 05th May, 2019.

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Forty six students were interviewed with questionnaire after completion of training and results were prepared to know the perceived effectiveness of training. A set of 10 items, containing information on different aspects of Python programming were presented to the respondents. The information about independent variables *viz.*, age, education, caste and gender was collected with the help of structured schedule and scales. Student perception about effectiveness of python programming was measured with the help of Likert type scale which were rated on a five point continuum, namely Strongly agree, Agree, Undecided, Disagree and Strongly disagree with a score of 5, 4, 3, 2, and 1 respectively for positive statement and vice-versa. Based on the score assigned to the respondents, the mean and standard deviation were calculated and categorized into five categories. Appropriate statistical tools like frequency, percentage were used to draw the meaningful interpretation.

Table 1. Distribution of the respondents according to their socio-personal characteristics

Particulars of variables	Respondents (N = 46)	
	Frequency	Percentage
Age		
Young (Upto 21)	01	2.17
Middle (22 to 33)	41	89.13
Old (34 and above)	04	8.70
Education		
B.E.	02	4.35
B.Tech	01	2.17
M.A.	01	2.17
M.Tech	12	26.09
M.Sc. (Agri)	04	8.70
Ph.D.	26	56.52
Caste		
SC	03	6.52
ST	04	8.70
SEBC	01	2.17
OBC	20	43.78
Open	18	39.13
Gender		
Male	30	65.22
Female	16	34.78

Results and Discussion

The profile of the participating students was studied; this includes socio-psychological characteristics of the respondents. It is observed from Table 1 that highest per cent of participating students (89.13%) were in middle age group (22 to 33 years), followed by 8.70 percentage were participated in old age group (34 and above). In the young age group (upto 21), the per cent of participating students was only 2.17 per cent. The findings of this study support the findings of Meena *et al.* (2014) and Ranjan *et al*. (2017).
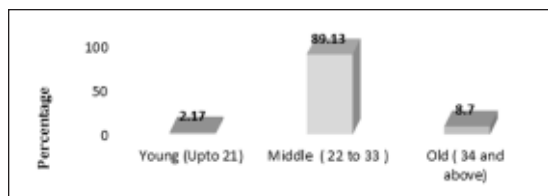
As regards to education of participating students, the data in Table 1 revealed that of the, 56.52per cent of the participants students were belonged to Ph.D., followed by 26.09 per cent M.Tech passed, 8.70 per cent M.Sc. (Agri.) and equal 2.17 per cent of the students belonged to B.Tech and M.A. category.

The data in Table 1 showed that the higher 43.78 per cent of the participating students were belonged to OBC category, followed by Open category (39.13 percent),ST category
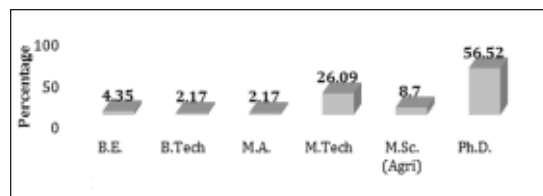

Fig. 1. Distribution of the respondents according to their age

Fig. 2. Distribution of the respondents according to their education

(8.70 per cent), SC category (6.52 per cent) and few (2.17 per cent) of them belonged to SEBC category. The finding finds support with the work of Meena *et al.* (2014).
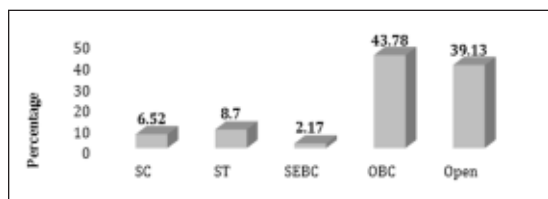

Fig. 3. Distribution of the respondents according to their caste

The findings regarding gender in Table 1 indicated that higher percentage (65.22%) of participating students belonged to male category followed by female category (34.78 per cent). This is findings is similar to the work of Ranjan *et al.* (2017).
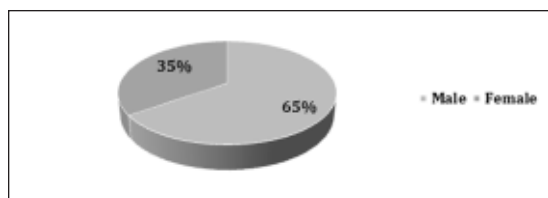

Fig. 4. Distribution of the respondents according to their Gender

A critical glance Table 2 postulated that the statement like 'training room and facilities were adequate and comfortable' (76.09 per cent) were having high strongly agreement. 60.87 per cent were up on the statement that 'trainer was knowledgeable about the training topics'. Little more one half (56.53 per cent) of the respondents were strongly agreement with the 'objectives of the training were clearly defined' followed by participation and interaction were encouraged' (54.35), 'training experience will be useful for future' (52.17 per cent), 'topics covered were relevant' (47.83 per cent), 'material distributed were helpful' (41.30 per cent) and 'training objectives were met (34.79 per cent).

It was also found that, slightly more than one half (52.17 per cent) of the respondents had agree on 'content was organized and easy to follow' followed by 'training objectives were met' (50.00 per cent), 'participation and interaction were encouraged' (43.48 per cent), equally little more than two fifth (41.30 per cent) of the respondents were agree with the statements like 'topics covered were relevant' and 'training experience will be useful for future' respectively. Equally slightly less than two fifth (39.14 per cent) had agreement on the 'material distributed were helpful' and 'time allotted for the training was sufficient' respectively.

Table 2. Statement wise distribution of the respondents according to their perception

Statement	Respondents (46)				
	SA	**A**	**U**	**DA**	**SD**
Objectives of the training were clearly defined	26 (56.53)	17 (36.95)	02 (4.35)	01 (2.17)	-
Participation and interaction were encouraged	25 (54.35)	20 (43.48)	01 (2.17)	-	-
Topics covered were relevant	22 (47.83)	19 (41.30)	05 (10.87)	-	-
Content was organized and easy to follow	13 (28.26)	24 (52.17)	06 (13.04)	03 (6.53)	-
Material distributed were helpful	19 (41.30)	18 (39.13)	06 (13.04)	03 (6.53)	-
Training experience will be useful for future	24 (52.17)	19 (41.30)	02 (4.35)	01 (2.17)	-
Trainer was knowledgeable about the training topics	28 (60.87)	11 (23.91)	05 (10.87)	02 (4.35)	-
Training objectives were met	16 (34.79)	23 (50.00)	06 (13.04)	01 (2.17)	-
Time allotted for the training was sufficient	14 (30.43)	18 (39.14)	08 (17.39)	06 (13.04)	-
Training room and facilities were adequate and comfortable	35 (76.09)	11 (23.91)	-	-	-

SA-Strongly Agree, A- Agree, U- Undecided, DA- Disagree,   SD- Strongly Disagree

It was also noticed that more than one fifth (17.39 per cent) of the respondents had undecided with the statement 'time allotted for the training was sufficient' followed by equally little more than one tenth (13.04 per cent) of the respondents were undecided with the statement like 'content was organized and easy to follow', 'material distributed were helpful' and 'training objectives were met' respectively. It was also observed that less than one fifth (13.04 per cent) of respondents were disagreement with the 'time allotted for the training was sufficient'.

It can be seen from Table 3 that more than one half (54.35 per cent) of the respondents were reported 'medium level' of perceived effectiveness for python training. Followed by 'low level' (21.74 per cent). Nearly less than one fifth (17.39 per cent) of the respondents were reported 'high level' of perceived effectiveness. Only 4.35 per cent of the respondents reported 'very high level' and only 2.17 per cent of the respondents were reported the 'very low' level of perceived effectiveness for python training. The result supports the findings of Ranjan et al. (2017) and Singh and Singh (2014).
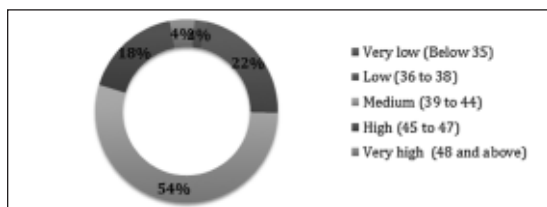

Fig. 5. Distribution of the respondents according to their overall perceived effectiveness

Evaluation of Perception of Respondents towards Python Training Programme : Based on all responses, total score and mean weighted score were computed for each statement. The mean weighted score was worked out by dividing the total score of each statement by number of respondents. The mean weighted score (MWS) for 10 statements was evaluated as per criterion prescribed in Table 4.

Table 3. Distribution of the respondents according to their overall perceived effectiveness

Perception	Respondents (46)	
	Frequency	**Percentage**
Very low (Below 35)	01	2.17
Low (36 to 38)	10	21.74
Medium (39 to 44)	25	54.35
High (45 to 47)	08	17.39
Very high (48 and above)	02	4.35
Total	46	100
Mean	41	
SD	6	

Table 4. Scale for evaluating positive and negative statements

Positive statement	Evaluation	Negative statement
Strongly disagree	Upto 1	Strongly agree
Disagree	Above 1 to Upto 2	Agree
Undecided	Above 2 to Upto 3	Undecided
Agree	Above 3 to Upto 4	Disagree
Strongly agree	Above 4	Strongly disagree

The total score of each statement, corresponding mean weighted score and its evaluation have been depicted in Table 5. The results presented in evaluation of responses have been summarized for positive/favorable perception and negative/unfavorable perception by participant students which have been presented and summarized briefly in Table 5.

It is observed Table 5 that MWS showed that participant students had clear positive response towards python programming training programme. These findings are suggestive to Educational Institution for preparing a suitable strategies for implementation of python programming training to students in order to develop cognitive compartment of the students with regards to help in learning programming languages in climate s mart agriculture and students will able to apply python programming

Table 5. Showing Total score, Mean Weighted Score, Evaluation, Extent Potential Ratio and Total Effectivess Score for each perceptions statement of student trainees

Statement	Respondents (N= 46)				
	TS	MWS	Evaluation	EPR	TES
Objectives of the training were clearly defined	206	4.48	SA	0.52	52
Participation and interaction were encouraged	203	4.41	SA	0.51	51
Topics covered were relevant	201	4.37	SA	0.50	50
Content was organized and easy to follow	185	4.02	SA	0.46	46
Material distributed were helpful	191	4.15	SA	0.48	48
Training experience will be useful for future	204	4.43	SA	0.51	51
Trainer was knowledgeable about the training topics	203	4.41	SA	0.50	50
Training objectives were met.	192	4.17	SA	0.48	48
Time allotted for the training was sufficient	178	3.87	A	0.45	45
Training room and facilities were adequate and comfortable	166	3.61	A	0.42	42

to illustrated complicated problems research activities in climate smart agriculture.

Further it could be observed from Table 5 that the total effectiveness score of ten statements was ranged from 42 to 52 per cent. However the effectiveness with regards to training room and facilities were adequate and comfortable was perceived as low by the respondents. Effective training room and facilities might further increase the training effectiveness.

Conclusion

On the basis of above findings, it can be concluded that students are becoming imperfection use of programming languages and this two days training programme overwhelming of them are having positive perception towards the python programming. However, still there is need to organizing a one week or ten days training on python programming with the inviting expert of that area which have students learn effectively and become a confident of using python programming languages.

Acknowledgement

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