INTERNATIONAL JOURNAL OF RESEARCH CULTURE SOCIETY
Monthly Peer-Reviewed, Refereed, Indexed Journal
Volume - 9, Issue - 4, April - 2025

ISSN(O): 2456-6683
[Impact Factor: 9.241]

IJRCS

DOIs:10.2017/IJRCS/202504014 --:-- Research Paper / Article / Review

ROLE OF EXPERIENTIAL LEARNING TO IMPROVE THE ACADEMIC PERFORMANCE IN BOTANY SUBJECT STUDENTS AT SENIOR SECONDARY LEVEL

[1]Pulkeet Kumawat, [2]Dr. Kuldeep

[1]Integrated B.Ed-M.Ed, Scholar Gyan Vihar School of Education, Suresh Gyan Vihar University, Jaipur

[2]Assistant Professor, Gyan Vihar School of Education, Suresh Gyan Vihar University, Jaipur

Email - [1]pulkeetkumawatp.k@gmail.com , [2]Kuldeephaldana@gmail.com

Abstract: *The current research examines the contribution of experiential learning to enhancing the academic performance of senior secondary school students in the field of Botany. The primary objective of the study was to evaluate the effectiveness of experiential learning in comparison to traditional teaching methods in improving students' academic outcomes. A pre-test–post-test experimental design was employed. to utilizing on 40 students (20 students in traditional learning and 20 students in experiential learning group) using multistage sampling method. The experiential learning group engaged in hands-on activities, real-world applications, and student-cantered tasks, while the traditional group received instruction through conventional lecture-based methods. The intervention was conducted over a period of 20 days. According to the statistical analysis of the pre-test and post-test results, the academic performance of the experiential learning group improved significantly compared to the traditional group. Additionally, the objectivity of the experimental comparison was validated by the comparable pre-test scores of the two groups. The results support the effectiveness of experiential learning as a teaching method for enhancing the academic achievement and conceptual understanding of Botany among senior secondary students.*

Key Words: *Experiential Learning, Academic Performance.*

1. INTRODUCTION

Education is defined in different ways, because it involves a variety of processes, activities, and experiences in order to promote learning and development. The gurukul was India's earliest system of education. It was a residential school system that existed as long as 5000 BC, where shishya (pupil) and guru (educator) would stay in the ashram (dwelling) of the guru or in near proximity. This permitted an emotional relationship to be built before passing on the knowledge. The language used was the old Sanskrit. The method by which traditional learning has been conducted for ages. And application of traditional learning also turned out to be quite right, but nowadays with experiential learning being employed to instill the children's curiosity and criticality. In conventional learning, theoretical portion is studied, hence the student was not in a position to apply it effectively in his life. Hence, keeping this issue in consideration, experiential learning is utilized nowadays, which proves to be very accurate in the current time. In experiential learning, the student himself undertakes hand on activity and goes through it and this work has not been conducted in some other studies since only the work and experience that one does offers employability at present.

Experiential learning is necessary for enhancing the learning process. Skills such as problem-solving, teamwork, and adaptability are also developed along with a better understanding of subjects by engaging students in hands-on practice, real-life problem-solving, and reflective practice. Thus, the children learn through the assistance of experiment learning and academic performance.

Experiential learning

Experiential learning, is a teaching method that places significant value on the role of hands-on experience, reflection, and active participation as effective ways of learning and skill acquisition. This method is based on the belief that people learn most effectively when they are actively involved in experiencing and dealing with the subject matter, and not by simply receiving information passively.

"experiential learning is the process of learning by doing. By engaging students in hands-on experiences and reflection, they are better able to connect theories and knowledge learned in the classroom to real-world situations". ***Kent state university***

"experiential learning involves the transformation of experience into effective learning. Kolb's experiential learning theory stresses how our experiences, including our thoughts, emotions and environment, impact the learning process". ***- David Kolb's.***

2. LITERATURE REVIEW OF THE STUDY

Sumarmi, et.al (2020) examined the impact of experiential learning models on high school students' learning scores and disaster countermeasures education abilities. The research involved 168 students, selected based on similar abilities. The experimental design included a pre-test and post-test control group design. Data was collected through questionnaires. The results showed a significant influence of experiential learning on students' learning scores and disaster education abilities. Compared to traditional and problem-based learning, experiential learning had a higher impact on learning value and disaster education abilities.

Thote (2021) research aimed to determine the impact of experiential learning activities on specific learning outcomes. The study involved 40 students in two groups, a study group and a control group, who were taught online due to the COVID pandemic. The study group was given experiential learning activities for a week. Data was collected through formative and summative tests. The study found that experiential learning positively influenced learning outcomes and academic performance in chemistry, with students showing greater advantages than mean and high-score students. The study highlights the importance of experiential learning in enhancing learning outcomes.

Farah (2021) throughout the learning process, some are observed to be hindrances for these students in completing their learning journey and achieving educational certificates, we have committed this article to highlight the most salient issues faced by scholarship students. Learning is not just the outcome of formal schooling, but also the outcome of families, communities and peers. Social, economic and cultural forces shape learning and hence academic success.

Kang, et.al (2022) found that experiential learning is an effective method for teaching User Experience (UX) to Human-Computer Interaction (HCI) students. A scoping review of 45 articles between 2000 and 2021 identified 12 experiential learning types used by HCI educators. Twenty-six articles indicated improvement in student learning outcomes, with these approaches facilitating textbook knowledge, user experience technical know-how, soft skills, student satisfaction, job marketability, and enhanced user diversity awareness.

Polat and Karabatak (2022) examined the impact of a flipped classroom model on academic achievement, satisfaction, and overall student belongingness. The study involved 94 undergraduate students from Turkey, divided into three groups: one experimental group with a flipped classroom model, one with a traditional mode, and one with a distance mode. Data was collected through pre-tests, post-tests, and statistical analysis. The results showed that the flipped classroom model significantly improved students' academic achievement, satisfaction, and overall belongingness compared to traditional and distance models.

The main goal is to implement changes in the arena of education and its practices. The manner in which conventional education has been functioning for a considerable period of time. And application of conventional education also turned out to be rather accurate, but now with experiential learning being practiced to nurture children's curiosity and analytical thinking. In conventional learning, theoretical portion is taught, hence the student could not utilize it effectively in his life. Thus, with regard to this issue, experiential learning is being utilized in the present time, which turns out to be quite right nowadays. In experiential learning, the student himself performs hand on activity and gets experienced and in this work we have not carried out in some earlier studies since only one's own work and experience gives employability in this era. Thus, we will provide the children with experience using the method of experiential learning and guide their learning process.

3. OBJECTIVES OF THIS STUDY

- To study the difference between the impact of the experiential learning and traditional learning on the academic performance of senior secondary student in botany.

4. HYPOTHESIS OF THE STUDY

- There is positive effect of experiential learning Programme on the academic performance of Senior Secondary school Students in botany.
- There is no significant difference between pre-test and post-test of academic performance of traditional learning group of Senior Secondary school Students in botany.
- There is no significant difference between the pre-test of academic performance of experiential learning group and the traditional learning group.
- There is a significant difference between the post-test of academic performance of experiential learning group and the traditional learning group.

5. RESEARCH METHOD AND DESIGN OF THE STUDY

Experimental method was employed by the researcher. Experimental method is the most suitable one when the intent is to decide a cause-and-effect relationship. Pre-test – post-test design of experimental research method was employed by the researcher.

SAMPLE AND SAMPLING

Multistage Sampling used by the researcher.

FINDING & ANALYSIS

H1: There is positive effect of experiential learning Programme on the academic Performance of Senior Secondary school Students in botany.

TABLE:1

Group	N	Mean	SD	t-value	df	Level of Significance	Result
Pre-Test	20	19.50	2.911	39.791	19	0.05	accepted
Post-Test	20	34.50	3.620				

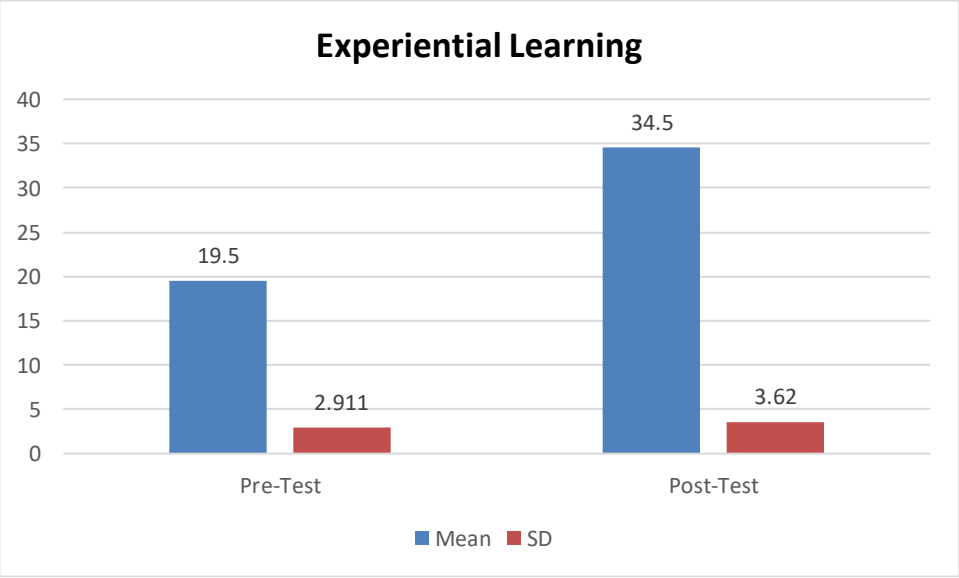

Table 1 shows that the pre-test mean score was 19.50 with a standard deviation of 2.911, while the post-test mean score increased significantly to 34.50 with a standard deviation of 3.620. The computed t-value of 39.791 is much greater than the critical value of 1.729 at the 0.05 level of significance for 19 degrees of freedom. This indicates that the

ISSN(O): 2456-6683
[Impact Factor: 9.241]

difference between the means is statistically significant. Therefore, the research hypothesis (H1) is accepted. The results clearly demonstrate that the experiential learning programme had a positive and significant impact on students' academic performance in Botany.

H0: There is no significant difference between pre-test and post-test of academic performance of traditional learning group of Senior Secondary school Students in botany.

TABLE:2

Group	N	Mean	SD	T-Value	df	Level of Significance	Result
Pre-Test	20	19.80	2.285	17.050	19	0.05	Not accepted
Post-Test	20	27.65	2.815				

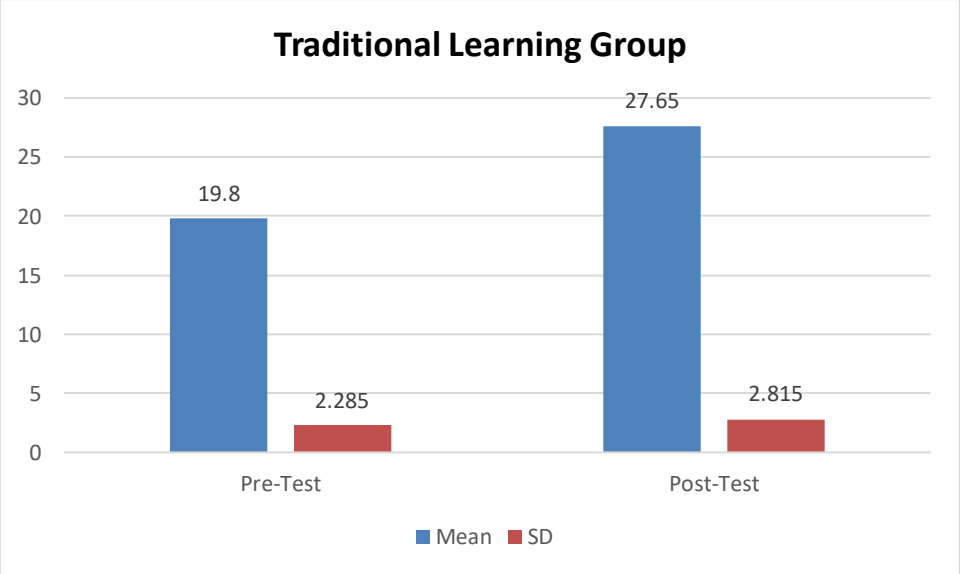

Table 2 shows that the pre-test mean was 19.80 with a standard deviation of 2.285, while the post-test mean increased to 27.65 with a standard deviation of 2.815. The calculated t-value was 17.050, which is greater than the critical value of 2.093 at the 0.05 level of significance for 19 degrees of freedom. Although the hypothesis assumed that there would be no significant difference between the pre-test and post-test academic achievement scores of the traditional learning group, the statistical analysis indicates that the difference is significant. Therefore, the null hypothesis is rejected.

H0: There is no significant difference between the pre-test of academic performance of experiential learning group and the traditional learning group.

TABLE:3

Group	N	Mean	SD	T-Value	df	Level of Significance	Result
Experiential Learning Group	20	19.50	2.911	0.363	38	0.05	accepted
Traditional Learning Group	20	19.80	2.285				

ISSN(O): 2456-6683
[Impact Factor: 9.241]

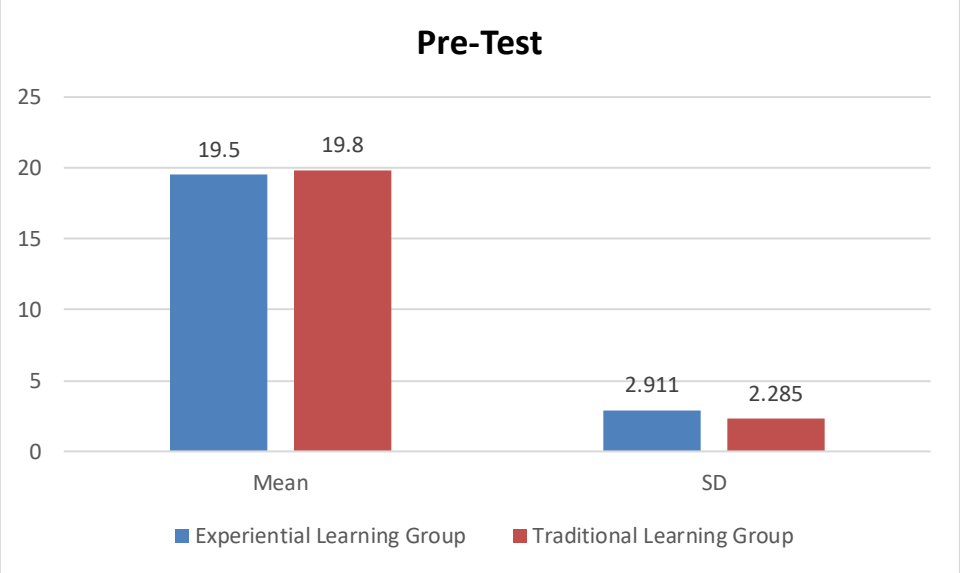

Table 3 shows that the mean pre-test score for the experiential learning group was 19.50 with a standard deviation of 2.911, whereas the traditional learning group had a mean score of 19.80 with a standard deviation of 2.285. The calculated t-value for the comparison was 0.363, which is less than the critical value of 2.024 at the 0.05 level of significance with 38 degrees of freedom. Since the t-value is not significant, the null hypothesis is accepted. This indicates that there is no significant difference in the pre-test of academic performance scores of the two groups, suggesting that both groups began with a fairly equal level of prior knowledge in Botany. This result supports the validity of the experimental design by confirming the comparability of the groups prior to the implementation of the different teaching methods.

H1: There is a significant difference between the post-test of academic performance of experiential learning group and the traditional learning group.

TABLE:4

Group	N	Mean	SD	T-Value	df	Level of Significance	Result
Experiential Learning Group	20	34.50	3.620	6.680	38	0.05	accepted
Traditional Learning Group	20	27.65	2.815				

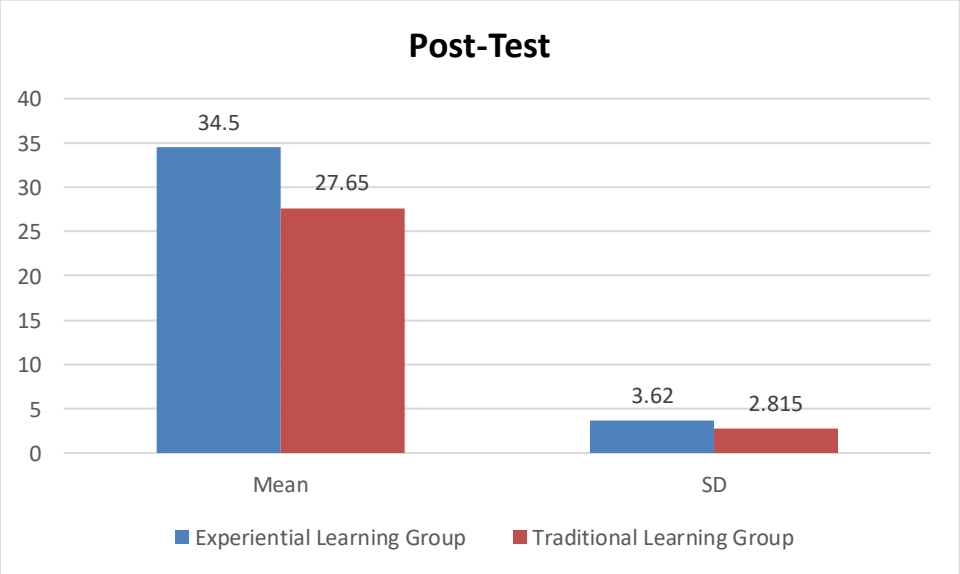

Table 4 indicates that the mean post-test score of the experiential learning group was 34.50 with standard deviation of 3.620, while the traditional learning group had a mean score of 27.65 with standard deviation of 2.815. The computed t-value for the comparison between the two groups was 6.680, which exceeds the critical value of 2.024 at the 0.05 level of significance with 38 degrees of freedom. Since the obtained t-value is greater than the critical value, the hypothesis is accepted. This indicates that there is a statistically significant difference in the post-test academic performance scores between the experiential and traditional learning groups.

These results prove the effectiveness of experiential learning to improve students' comprehension and recall of the course material, leading to improved academic performance. The increased mean scores in the Experimental Group affirm the positive effect of experiential learning on Botany students' academic performance.

6. DISCUSSION

The findings of this study strongly reinforce the growing body of literature that emphasizes the effectiveness of experiential learning in enhancing academic performance. The significant improvement observed in the post-test scores of the experiential learning group compared to the traditional learning group mirrors the conclusions drawn by **Sumarmi et al. (2020)**, who reported that experiential models significantly boosted students' learning scores and disaster preparedness. Similarly, **Thote (2021)** demonstrated that experiential activities positively influenced students' academic outcomes in chemistry, which aligns well with the current study's subject focus in Botany. This consistency across scientific disciplines indicates that experiential learning promotes deeper understanding and retention of concepts through active engagement. Furthermore, the results correspond with the study by **Kang et al. (2022)**, which highlighted experiential learning's role in fostering technical knowledge and student satisfaction, indicating that hands-on and student-centered pedagogies can bridge the gap between theoretical learning and real-world application. Additionally, while **Polat and Karabatak (2022)** emphasized the effectiveness of flipped classroom models, which share common ground with experiential strategies in their interactive nature, the present study affirms that such learner-focused approaches significantly outperform traditional methods in improving academic achievement. Though **Farah (2021)** pointed out that external social and economic factors also shape academic success, this study underscores the pivotal role instructional strategies play within the classroom context. Overall, the present research not only validates existing theories such as Kolb's Experiential Learning Theory but also contributes empirical evidence from the senior secondary Botany domain, strengthening the argument for integrating experiential methods into mainstream education to foster conceptual clarity, academic growth, and real-life applicability.

The results of the study clearly demonstrate the effectiveness of experiential learning in enhancing students' academic performance in Botany. The first hypothesis, which proposed that experiential learning would have a positive impact on student achievement, was strongly supported. Students exposed to experiential learning methods showed notable improvement in their understanding and academic outcomes, which can be attributed to the active, hands-on nature of the learning process. This approach encourages deeper engagement, critical thinking, and better retention of concepts, making it more impactful than passive learning environments. The second hypothesis, which assumed no significant difference between pre-test and post-test scores of the traditional learning group, was not accepted. Although some improvement was noted, it was relatively limited. This suggests that traditional lecture-based teaching may help in reinforcing factual knowledge, but it falls short in promoting deep comprehension and practical application, which are essential components of meaningful learning. The third hypothesis examined the comparability of the two groups before the intervention. The results confirmed that both the experiential and traditional learning groups began with similar levels of prior knowledge. This was crucial in validating the experimental design, as it ensured that the observed differences in performance post-intervention could be confidently attributed to the teaching methods rather than pre-existing academic disparities. Finally, the fourth hypothesis proposed that there would be a significant difference in post-test performance between the two groups. This was confirmed, with the experiential learning group outperforming the traditional group. The superior outcomes can be attributed to the experiential group's involvement in interactive activities that connected theoretical content to real-life experiences. Such engagement fosters active learning, making abstract concepts more tangible and easier to understand. This finding reinforces the argument that experiential learning is not only more effective for academic achievement but also for fostering a deeper and more enduring understanding of subject matter.

7. CONCLUSION

This research study investigated the role of experiential learning in improving the academic performance of senior secondary students in the subject of Botany. The primary aim was to compare the effectiveness of

experiential learning with traditional lecture-based teaching methods. An experimental design using a pre-test and post-test approach was implemented with two groups—one receiving experiential learning and the other taught through traditional methods. Experiential learning activities included hands-on tasks, real-world applications, and student-centered engagement, designed to foster deeper conceptual understanding. The results revealed that students exposed to experiential learning demonstrated significantly greater improvement in academic performance than those taught through traditional methods. Both groups started at a similar academic level, validating the fairness of the comparison. However, after the intervention, the experiential group showed a clear advantage, highlighting the pedagogical value of experiential approaches in science education. The study's findings are consistent with prior research and theoretical frameworks, particularly Kolb's Experiential Learning Theory, which emphasizes the importance of active participation and reflection in the learning process. The study concludes that experiential learning not only enhances subject knowledge but also promotes critical thinking, engagement, and the practical application of concepts. It recommends the integration of experiential strategies into the curriculum and suggests further exploration of its impact across different subjects, age groups, and modern learning tools such as digital simulations and virtual labs.

8. SUGGESTION:

- To evaluate the effects of experiential learning across topic areas, future studies can examine how well it works in other scientific disciplines like physics, chemistry, and zoology.
- In order to see how age and maturity affect the results of experiential learning, studies could be expanded to include students from various educational levels, such as middle school or degree programs.
- Comparative studies between experiential learning and other contemporary teaching strategies like project-based learning or flipped classrooms may be the subject of future research.
- Investigating the integration of digital technologies, augmented reality (AR), or virtual labs with experiential learning in botany could lead to new educational opportunities.
- Policy-making and curriculum revisions can benefit from more research into the systematic integration of experiential learning within the current Botany curriculum.

REFERENCES:

1. Kolb, D. A. (2014). *Experiential learning: Experience as the source of learning and development*. FT press.
2. Jose, S., Patrick, P. G., & Moseley, C. (2017). Experiential learning theory: the importance of outdoor classrooms in environmental education. *International Journal of Science Education, Part B*, *7*(3), 269-284.
3. Lewis, L. H., & Williams, C. J. (1994). Experiential learning: Past and present. *New directions for adult and continuing education*, *1994*(62), 5-16.
4. Gentry, J. W. (1990). What is experiential learning. *Guide to business gaming and experiential learning*, *9*(1), 20-32.
5. Kent, O. (1960). Kent State University. *Bureau of Educational Research and*.
6. Lee, P., & Caffarella, R. (1994). Methods and techniques for engaging learners in experiential learning activities. *AUTHOR Jackson, Lewis, Ed.; And Others TITLE Applying Experiential Learning in College Teaching and Assessment: A Process Model. INSTITUTION University of Northern Colorado, Greeley. PUB DATE (Oct 92*, 28.
7. Austin, M. J., & Rust, D. Z. (2015). Developing an Experiential Learning Program: Milestones and Challenges. *International Journal of Teaching and Learning in Higher Education*, *27*(1), 143-153.
8. Hedin, N. (2010). Experiential learning: Theory and challenges. *Christian education journal*, *7*(1), 107-117.
9. Jeyaraj, J. S. (2019). Traditional learning vs. experiential learning. *American College Journal of English Language and Literature (ACJELL)*, *9*, 43-46.
10. Raja, F. U. (2018). Comparing traditional teaching method and experiential teaching method using experimental research. *Journal of Education and Educational Development*, *5*(2), 276-288.
11. Beard, C., & Wilson, J. P. (2018). *Experiential learning: A practical guide for training, coaching and education*. Kogan Page Publishers.
12. Chickering, A. W. (1977). Experience and Learning. An Introduction to Experiential Learning.
13. https://www.communicationtheory.org/experiential-learning-kolbs-learning-styles-and-cycle/