Innovations

Analysis of Constructivist Learning Management and Scholastic Satisfaction of Secondary Students in a Hyflex Learning Modality

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Abstract: *Following the conclusion of the Covid-19 pandemic as a public health crisis, the Department of Education has recognized the importance of reintroducing face-to-face classes in a gradual manner. This decision aims to enhance the academic growth and overall well-being of learners. The primary objective of this research was to assess the level of agreement among high school students regarding the concept of constructivist learning, as well as their satisfaction with their academic progress. This evaluation took place within the Hyflex learning environment at UB Science High School.This research study is highly relevant and responsive to local development as it specifically addresses the current needs of the educational sector.It aims to enhance and strengthen new procedures that are being implemented to achieve the utmost attainment of SDG 4. The sample size for this study consisted of 408 respondents who were chosen through random sampling, in accordance with the cross-sectional research design. The findings of this study are significant and indicate that students strongly agree that communication, interaction, building relationships, developing skills, managing time, evaluating performance, and teaching and learning are all present during the Hyflex modality. This implies that the Hyflex modality provides students with an avenue and freedom to express their thoughts, make decisions, communicate with their teachers and peers, and most importantly, participate in decision-making processes. Furthermore, the data reveals that there is a substantial positive link between teaching and assessment (r=0.78), as well as a moderate correlation between teaching and overall satisfaction (r=0.54) and assessment and overall satisfaction (r=0.54), respectively. These findings suggest that there is sufficient evidence to support the notion that the teaching and assessment methods employed in the school have a direct impact on the overall satisfaction levels of the students.*
Keywords: *constructivist learning management, scholastic satisfaction, hyflex, high school, cross-sectional*

Introduction

The relaxation of public health regulations during the pandemic has enabled schools to assess the learning platforms currently available to students. Over the past two years, due to Covid-19, the only learning platform offered to students was pure online modality. However, with borders reopening and social restrictions easing, the Department of Education has decided to gradually introduce face-to-face classes to enhance the academic progress and well-being of students (DepEd, 2022). Consequently, Hyflex learning has quickly become a standard practice in the global educational sector. Hyflex learning is an institutional strategy that integrates both face-to-face and online learning in synchronous and asynchronous formats (Liu & Rodriguez, 2019). For instance, many educational institutions in Mexico have embraced the hyflex approach to meet student needs (Rodriguez, 2022), while in the Philippines, over 6,121 schools have started conducting limited face-to-face classes alongside online learning (Fuentes, 2022). In Baguio, 11 public schools have been permitted to continue with hybrid learning, whereas most private institutions are offering hyflex learning for the academic year 2022-2023 (Cabreza, 2022).

This advancement in the field of education serves as a method to offer the most optimal learning experience to all individuals involved by delivering high-quality education despite the challenges outlined in SDG 4, which focuses on Quality Education. The primary objective of SDG 4 is to promote opportunities for lifelong learning, ensuring the effective acquisition of relevant knowledge, skills, and competencies. These goals can be best achieved through the implementation of a constructivist learning environment, skillfully managed by teachers regardless of the teaching platform utilized. A constructivist learning environment provides a platform for students to develop and refine their skills as they actively engage in the learning process, recognizing that learning is a socially and culturally embedded experience (Fernando &Marikar, 2017). Consequently, it is imperative to have tools that assess these learning skills in students, as the success of establishing a constructivist learning environment is closely linked to how teachers conduct their classes, hence the term "constructivist learning management." Therefore, teachers play a crucial role in ensuring that any learning modality becomes a fulfilling experience for every learner. Academic satisfaction refers to the contentment students derive from their school experiences and the fulfillment of their learning expectations while attending the institution (Naeem, 2020).

The purpose of this study is to evaluate the consensus among high school students regarding their satisfaction with academics and the existence of a

constructivist learning environment in the Hyflex mode. More specifically, it seeks to address the following goals:

1. To determine the agreement of students regarding the presence of constructivist learning management in a hyflex modality.
2. To assess the significant difference in the agreement of students regarding the presence of constructivist learning management during hyflex modality in terms of the different Grade levels.
   Ho: There is significant difference in the perception of students regarding the presence of constructivist learning management during hyflex modality in terms of the different Grade levels.
3. To determine the scholastic satisfaction in relation to teaching and assessment of students during hyflex modality.

Literature Review

Hyflex learning has become the prevailing standard in the realm of education, as it integrates a blend of face-to-face and synchronous learning elements. This innovative approach offers unparalleled flexibility for students' educational journey, as supported by the research of Binnewies (2019), Wilson (2021), and Calafiore (2021).

However, research indicates that hybrid-virtual settings tend to have lower levels of relatedness to peers, interaction with other students, and intrinsic motivation compared to in-class instruction (Raes, 2020 & Matta, 2022). Consequently, this impacts the implementation of constructivist learning theory in the classroom. Constructivist theory emphasizes the importance of learners actively constructing knowledge through collaborative activities, reflection, and conversation with others to foster meaningful learning experiences (Magana, 2022).

Indeed, as Magana (2022) pointed out, the integration of cooperative learning pedagogy with hyflexmodality can offer students a learning experience comparable to that of a traditional setup. The hyflex platform serves as a solution to the current pandemic by blending various modes of learning into a single course, allowing students to select the approach that best meets their learning requirements.

Nevertheless, the level of academic satisfaction among students in the hyflex platform varies. Some believe that student satisfaction is higher in face-to-face classes compared to synchronous ones, while other research indicates that students generally express satisfaction with the hyflex modality, as evidenced by their academic performance (Matta, 2022, Calafiore, 2021, Rhoads, 2020,

&Bakach, 2021). Studies have shown that students' final grades were similar in both Hyflex and hybrid modalities, with a majority of students acknowledging the positive impact of Hyflex learning on their educational journey (Calafiore, 2021 &Bakach, 2021).

Conceptual Framework

The research is built upon the following theories. Constructivism serves as the theoretical foundation for the initial objective. According to this theory, students play an active role in their learning process, with classroom experiences influencing their knowledge. Additionally, learners reflect on their school experiences, integrating new ideas with existing knowledge. This approach is deeply rooted in the learning theories of Dewey, Piaget, Vygotsky, Gagne, and Bruner (Kurt, 2021).

Objective two is reinforced by Tinto's theory of integration, which was later refined by Pascarella and Terenzini. They defined academic integration in their paper as the blend of students' academic performance and the frequency of their interactions with instructors and classmates. Satisfaction serves as a common factor that connects both social and academic integration (Liu, 2004).

Methodology

Study Design

The study used a cross-sectional research design, gathering data from students who were currently part of the Hyflex program at the University of Baguio Science High School during a specific period (Setia, 2016). The research focused on exploring the existence of constructivist learning management in secondary schools and how it relates to students' academic satisfaction in the context of Hyflex learning. The independent variable examined was the Hyflex learning approach, while the dependent variables included students' academic satisfaction and their perception of constructivist learning management within their classrooms.

Population of the Study

The research involved students from Grade 7 to Grade 12 at UB Science High School, aged 13-18. Only students enrolled in the Hyflex modality for SY 2022–2023 in Grades 7–12 were included, while those in the full online modality were not part of the study. A random sampling design was utilized, aiming to gather 408 responses from the target population using Cochran's formula at a 95% confidence level.

Data Gathering Tool

The instrument used was a survey questionnaire on constructivist learning management according to Yildirim (2014) and a survey on student satisfaction according to Fieger (2012). The items in the questionnaire were adapted to the needs of the study. A 4-point Likert scale was verified by a university tool validator and subjected to a reliability test to measure the consistency of participants' responses across different occasions.

Data Gathering Procedure

Prior to conducting the survey, RIECO was contacted to obtain their approval for distributing the questionnaire to the participants. Once RIECO approved the request, the researchers compiled a comprehensive list of all the sections in UB Science High School. Additionally, the survey questionnaires was transformed into a google form. The link to the questionnaire was then shared in the advisory google classes of UB Science High School, with the assistance of the class advisers and beadles. To ensure that all participants were informed of their rights as respondents, the consent form was integrated into the google form of the questionnaire. The questionnaire remained accessible for a minimum of one month, allowing ample time for the respondents to take part.

Treatment of Data

The data collected was analyzed using the following statistical methods. To address objective #1, the mean and standard deviation were utilized to determine the average score of the respondents and the extent of variation from the mean. Objective #2 involved the use of analysis of variance to identify differences in responses among all grade levels at UB Science High School. Lastly, objective #3 utilized regression testing to examine the impact of the independent variable on the dependent variable across all grade levels at UB Science High School.

Ethical Consideration

The respondents voluntarily participated in the study, with no obligation to take part and the freedom to withdraw at any time. Participant anonymity was maintained, ensuring that responses in Google forms remained confidential and accessible only to researchers. For respondents under 18, parental permission was obtained through an option in the Google form, while minor participants were required to click the agree button to provide assent.

The researchers outlined the goals and purposes of the study in the google form to effectively manage risks. Participants were urged to seek clarification on

any unclear aspects by posing questions, ensuring that any potential harm caused by the study could be minimized. Similarly, participants were advised to reach out to the researchers if they felt uneasy about responding to the questionnaire. The researchers did not request any additional documents or materials beyond what was already included in the questionnaire and discussed with the respondents. The research findings were presented through the use of an infographic.

Results
Presence of Constructivist Learning Management in a Hyflex Modality

The agreement of students regarding the presence of the different areas of constructivist learning management during hyflex modality was measured. The succeeding Tables show the result of the survey.

Table 2
Presence of Communication and Interaction

Indicators (n=408)	Mean	SD	Description
1. Encourage to express my thoughts.	3.26	0.70	Strongly Agree
2. Encourage to give my decision independently.	3.33	0.66	Strongly Agree
3. Encourage to communicate with the teacher and my classmates.	3.35	0.75	Strongly Agree
4. Encourage to participate in decision making process	3.37	0.65	Strongly Agree
Overall	**3.33**	**0.69**	**Strongly Agree**

Table 2 depicts that communication and interaction, an area of constructivist learning management, is present and highly practiced during the conduct of hyflex modality in UB Science High School as perceived by the participants (M=3.33, SD=0.69). Data further exemplifies an increase in the mean from the first indicator to the last indicator of communication and interaction.

Table 3

Presence of Relation Establishment

Indicators (n=408)	Mean	SD	Description
1.Gives frequent feedback.	3.22	0.73	Agree
2.Ask questions which provoke higher thinking in the students.	3.37	0.71	Strongly Agree
3.Guide the students to give meaning to what they learn.	3.43	0.68	Strongly Agree
4.Help students construct knowledge from prior experiences.	3.43	0.67	Strongly Agree
Overall	**3.36**	**0.70**	**Strongly Agree**

Table 3 shows the indicators for teacher behavior in this study are generally positive. For indicator 1 (gives frequent feedback), the mean score is 3.22, indicating that on average, the teachers in the study agree that they provide frequent feedback to their students. For indicators 2, 3, and 4 (ask questions that provoke higher thinking, guide students to give meaning to what they learn, and help students construct knowledge from prior experiences), the mean scores are 3.37, 3.43, and 3.43 respectively.

Table 4

Presence of Skills Development

Indicators (n=408)	Mean	SD	Description
1.Supports the development of research skills.	3.49	0.61	Strongly Agree
2. Supports the development of problem solving skills.	3.51	0.63	Strongly Agree
3. Supports the development of critical thinking skills.	3.48	0.65	Strongly Agree
4. Supports the development of realization of skills.	3.49	0.64	Strongly Agree
Overall	**3.49**	**0.63**	**Strongly Agree**

The mean score for all four indicators in skills development is 3.49, indicating that respondents generally agreed that the program supports the development of these skills. The standard deviation (SD) for each indicator ranges from 0.61 to 0.65, suggesting that there is some variability in responses, but the majority of respondents still strongly agreed. The overall mean and SD of

3.49 and 0.63 respectively, also suggest a strong agreement.

Table 5
Presence of Time Usage and Assessment

Indicators (n=408)	Mean	SD	Description
1.Gives necessary time to answer questions.	3.26	0.77	Strongly Agree
2.Gives enough time in learning activities.	3.24	0.79	Agree
3.Encourage to use time efficiently and effectively.	3.44	0.70	Strongly Agree
4.Uses different assessment techniques to evaluate students.	3.39	0.71	Strongly Agree
Overall	**3.33**	**0.75**	**Strongly Agree**

Based on the data provided, it appears that respondents generally agree to strongly agree with the time usage and assessment indicators. The low standard deviations suggest that there is consistency in the responses, indicating that most respondents share similar opinions about these indicators.

The mean for the indicators of time usage and assessment in this study is 3.33, indicating a strong agreement. The standard deviation is 0.75, suggesting a moderate amount of variation in the responses.

Table 6
Presence of Learning and Teaching

Indicators (n=408)	Mean	SD	Description
Focuses on principal concepts.	3.41	0.62	Strongly Agree
Uses various teaching methods and techniques.	3.41	0.70	Strongly Agree
Devise activities that will attract students' attention	3.27	0.79	Strongly Agree
Center the learning around students' interest and needs.	3.27	0.79	Strongly Agree
Overall	**3.34**	**0.73**	**Strongly Agree**

The mean for the indicators of learning and teaching in this study is 3.34, indicating a strong agreement. It is clear that participants strongly agreed with

the statements related to learning and teaching, with a mean score of 3.34. While there is some variation in responses, the overall agreement is strong.

Significant Difference in the Presence of Constructivist Learning Management in a Hyflex Modality

The responses of the students were analyzed using inferential statistics to check if there is a significant difference in their perceptions regarding the presence of constructivist learning management during hyflex modality. The following tables shows the result.

Table 7: Significant Difference in Communication and Interaction Between Grade Levels

Grade Level	n	Mean	SD	p-Value	Interpretation
7	123	3.19	0.64		
8	94	3.52	0.50		
9	56	3.30	0.54	0.003*	Significant
10	61	3.29	0.65		
11	20	3.31	0.37		
12	55	3.39	0.52		

*p>0.05

Table 7 shows that there is a significant difference in the area of communication and interaction in constructivist learning management between grade levels, p> 0.003. Post hoc comparisons using the Tukey HSD test indicated that the mean score of Grade 7 (M = 3.19, SD = 0.64) was significantly different than Grade 8 (M = 3.52, SD = 0.50) in terms of communication and interaction during hyflex learning.

Table 8: Significant Difference in Relation Establishment Between Grade Levels

Grade Level	n	Mean	SD	p-Value	Interpretation
7	123	3.26	0.59		
8	94	3.46	0.49		
9	56	3.44	0.53	0.015*	Not Significant
10	61	3.32	0.66		
11	20	3.36	0.46		
12	55	3.40	0.60		

*p>0.05

Table 8 presents that there is no significant difference regarding relation establishment in constructivist learning management between grade levels. Based on the data, the standard deviation of the following grade levels is lower than one indicating a low variance.

Table 9
Significant Difference in Skill Development Between Grade Levels

Grade Level	n	Mean	SD	p-Value	Interpretation
7	123	3.38	0.58		
8	94	3.49	0.50		
9	56	3.59	0.50	0.08*	Not Significant
10	61	3.52	0.58		
11	20	3.61	0.42		
12	55	3.58	0.55		

*p>0.05

As shownin Table 9, there is no significant difference in skills development in constructivist learning management during hyflex learning as perceived by the different grade levels. The data shows that the standard deviation is low indicating that students' responses are quite similar to each other agree that Hyflex learning supports the development of various skills such as research, problem solving and critical thinking.

Table 10: Significant Difference in Time Usage and assessment Between Grade Levels

Grade Level	n	Mean	SD	p-Value	Interpretation
7	123	3.34	0.60		
8	94	3.45	0.53		
9	56	3.25	0.54	0.04*	Significant
10	61	3.28	0.73		
11	20	2.99	0.61		
12	55	3.39	0.68		

*p>0.05

Table 10 shows that there is significant difference in time management and assessment during hyflex learning as perceived by the different grade levels, p> 0.04. Post hoc comparisons using the Tukey HSD test indicated that the mean score of Grade 7 (M = 3.19, SD = 0.64) was significantly different than Grade 9 (M

= 3.25, SD = 0.54), Grade 10 (M = 3.28, SD = 0.73), Grade 11 (M = 2.99, SD = 0.61), and Grade 12 (M = 3.39, SD = 0.68)

Table 11: Significant Difference in Time Usage and assessment Between Grade Levels

Grade Level	n	Mean	SD	p-Value	Interpretation
7	123	3.26	0.61		
8	94	3.44	0.52		
9	56	3.28	0.59	0.17*	Not Significant
10	61	3.32	0.72		
11	20	3.25	0.51		
12	55	3.46	0.61		

*p>0.05

As seen from Table 11, there is no significant difference in learning and teaching in constructivist learning management during hyflex learning as perceived by the different grade levels. Data shows a standard deviation below which means that responses are clustered around the mean.

Scholastic satisfaction in relation to teaching and assessment of students during hyflex modality

The responses of the students were analyzed using regression to analyze the relationship of teaching and assessment to overall satisfaction. The table and graph shows the result of this objective.

Table 12: Relationships of areas in scholastic satisfaction to the overall satisfaction of students

Variables	n	Mean	SD	1	2	3
Teaching	408	3.42	0.68	-		
Assessment	408	3.39	0.68	0.78*	-	
Overall Satisfaction	408	3.44	0.67	0.54*	0.54*	-

*p<0.05

Table 12 and figure 2 show that there is a strong positive correlation between teaching and assessment $r(408) = .78$ and moderate correlation between teaching and overall satisfaction $r(408) = .54$ and assessment to overall satisfaction $r(408) = .54$ respectively.

Discussion

Hyflex modality provides an avenue and liberty for students to express their thoughts, make decisions, communicate with their teachers and peers and most specially participate in decision making. Although, it may take more effort for students to communicate and collaborate with their classmates during Hyflex modality, still this new mode of learning does not hinder the development of these two 21st century skills. This result corroborates the research of Magana et al.'s (2022), whereby Hyflex learning offered a comparable situative learning experience for students in terms of communication and teamwork which is mostly attained during traditional teaching.

The mean score for relationship building suggests a high level of consensus among the educators involved in the research regarding their implementation of positive practices. This finding supports Kim's (2005) research, which highlighted how teachers structure the educational experience around the students' individual interests and requirements, encouraging them to inquire, generate innovative concepts, make predictions and observations, collaborate with others, and experiment with their hypotheses.

Furthermore, it is essential for educators to take charge of the classroom and create a conducive learning environment through effective teaching methods in order to enhance students' engagement and academic outcomes. This finding aligns with the research conducted by Muhonen and colleagues (2011), which highlights the indirect impact of teachers' assignment of learning tasks on students' educational progress.

The participants were in strong agreement with the statements concerning time allocation and assessment, specifically in terms of providing adequate time for answering questions, ensuring sufficient time for learning activities, promoting efficient and effective time utilization, and employing diverse assessment techniques to evaluate students. This finding supports Bakach's (2021) study, which identified a key theme of "Enhanced learning experiences and outcomes" that students in the HyFlex model perceived as having positively impacted their learning experiences. Furthermore, it was highlighted that this theme included various sub-themes, with students expressing feelings of enhanced learning and empowerment.

Teachers have a significant impact on developing successful assessments and evaluations that support students in reaching their educational objectives. It is imperative for educators to concentrate on fundamental ideas, employ diverse instructional strategies, and customize instruction to match students' preferences and requirements in order to enrich the educational process. This is consistent

with Howard et al.'s (2009) research, which underscores the significance of offering relevant tasks that connect to students' personal experiences or real-world situations.

Regarding the significant difference in the presence of constructivist learning management in a Hyflex modality, Tukey HSD test indicated that the mean score of Grade 7 was significantly different than Grade 8 in terms of communication and interaction during Hyflex learning. This is because 7th graders are new students in the high school department and they come from different schools and different backgrounds. At this grade level, most students do not know each other and they are adjusting to the new environment and the culture of the school they are enrolled in. Most students are shy and have a lot of apprehensions hindering them from openly communicating and collaborating with their classmates. This result corroborates the study of Kohnke& Moorhouse (2021), stating that Hyflex learning poses communication challenges between students. Likewise, according to Matta &Palvia (2022), interaction amongst students during online mode is inherently reduced. Therefore, these realities in online learning greatly affects the ability of grade 7 students to freely interact and collaborate with one another.

Moreover, teachers have established good relationships with their students anchored in mutual respect and open communication. This result corroborates the study of Magana et al.'s (2022), whereby students enrolled in hyflex learning, regardless of grade level, established good relations by applying conflict resolution strategies such as accommodating, compromising, and collaborating. These effective conflict resolution strategies will help students establish good relationships amidst hyflex learning whatever grade level they may be in.

The findings suggest that there is a low standard deviation in skills development, indicating that the students' responses are highly consistent in their agreement that Hyflex learning facilitates the enhancement of various skills like research, problem solving, and critical thinking. This suggests that the teaching strategies implemented during Hyflex learning effectively foster these 21st century skills. These results align with the research conducted by Jongmuanwai et al. (2021), which supports the notion that Hyflex learning significantly enhances critical thinking abilities.

The responses provided by Grade 7 students regarding the utilization of time and evaluation differed significantly from those of students in grades 9 to 12. This disparity can be attributed to the fact that Grade 7 students are still in the process of familiarizing themselves with the school's procedures and criteria for effectively managing and utilizing time to complete assessments and other responsibilities. This finding supports the assertion made by Alhazbi& Hasan

(2021) that students need to possess considerable time management and self-regulation skills in order to thrive in a hyflex learning environment.

In the area of learning and teaching, teachers are highly trained to meet learning competencies through various methods of teaching and arousing interest in students even during the Hyflex platform. This result corroborates the research of Bakach (2021) stating that students enrolled in Hyflex learning exhibit more positive perception of the impact of this modality on their learning compared to students who are enrolled in a full face to face class.

There is sufficient evidence to suggest that the teaching and assessment methods used in the Hyflex modality have a significant impact on students' overall satisfaction. It is observed that effective explanation of the content leads to higher scores among students. Therefore, implementing innovative teaching strategies and assessments can further enhance students' satisfaction. This finding supports Bakach's (2021) study, which highlights the positive learning experience and outcomes associated with the Hyflex modality. Additionally, Rhoads (2020) affirms the positive relationship between the Hyflex modality and student satisfaction.

Conclusion

Despite certain difficulties, the Hyflex learning modality is successful in fostering a constructivist learning environment among students. Even if working with others will require more deliberate effort, this platform still shows to enhance students' abilities and teach them how to interpret their prior knowledge and experiences. Because this innovative platform was created to better meet the needs of students by integrating online and classroom-based components, it is flexible and has been shown to increase learners' academic satisfaction.

Given that the success of establishing a constructivist learning atmosphere is closely tied to the way teachers conduct their classes, it is imperative to have tools that evaluate students' proficiency in these learning abilities. This is where the concept of constructivist learning management comes into play. Consequently, teachers play a pivotal role in guaranteeing that students are content with the learning platform they opt for.

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