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Learning analytics for students' academic performance in faculty of education, university of Port Harcourt

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Abstract
The study investigated learning analytics for students' academic performance in Faculty of Education, University of Port Harcourt. Two research objectives, two research questions and two research hypothesis guided the study. A descriptive Survey design was used for the study. The population of the study comprised all Year 1 students from eight departments in Faculty of Education, University of Port Harcourt, Rivers State. The departments are Department of Curriculum studies/ Educational Technology, Educational Management, Educational Foundation, Adult and Non- Formal Education, Educational Psychology, Human Kinetics, Early Childhood and Library Studies. A sample of 300 students was randomly selected for the study from the six departments. Stratified random sampling techniques were used for the study and the instrument used to collect data was a structured questionnaire entitled Learning Analytics for Student Academic Performance in Faculty of Education, University of Port Harcourt (LASAPFE) with 20 items. Mean scores, Standard deviation, and ANOVA were the statistical tools used in the study. The instrument was given to experts in the field of Educational Technology and Measurement and Evaluation to ensure its validity. Test-retest was applied to ensure the reliability of the instrument and a coefficient of 0.86 was obtained. The study found that it was additionally discovered that understudies incline toward exhibition, exchange, guided-critical thinking, diversion/re-enactments, helpful, flipped, mixed and conceptualizing instructing styles, it was also found that students favoured visual and verbal learning styles. Based on the conclusion, the researcher recommends that Teachers should disclose to understudies why different strategies for educating ought to be utilized in the classroom and the advantages they will get from them, also teacher's instructing strategies ought to be good with the learning styles of understudies.

Keywords: learning analytics, student's academic performance

Introduction
Information on investigation has caught the consideration of business pioneers and innovation organizations. The wide guarantee of investigation is that new bits of knowledge can be picked up from top to bottom examination of the information preliminaries left by people in their collaborations with others, with data, with innovation, and with associations. The quick advancement of huge information techniques and devices match with the new administration and estimation forms in enterprises. The term business knowledge is utilized to depict the crossing point of information and understanding. At the point when connected to the instruction part, examination falls into two wide segments in particular; learning and scholarly. Investigation is portrayed as an enveloping and multi-dimensional field that utilizes arithmetic, measurements, prescient demonstrating and machine-learning methods to discover significant examples and information in recorded information (Knight, 2018) [3].

Learning investigation is another territory of movement, however, is being based over different followers with a long history. A few, for example, insights, have been around for a considerable length of time; others like interpersonal organizations examination are significantly more afterwards. Learning investigation covers an extensive variety of examination, which are characterized as Full scale, Meso and Miniaturized scale levels. Learning investigation can enable understudies to distinguish their most reasonable time of day to realize, which techniques are best for them, and it can likewise enable instructors to demand a greater commitment from understudies. With learning examination, it is conceivable to perceive how understudies learn and which assets they pick, this has the colossal potential for e-learning assets in advanced education. Educators would now be able to imagine how singular understudies interface with assets, pinpoint regions where they turned out badly and from that, work in reverse to discover why (Simon, 2017) [7]. Instructors can investigate understudy cooperation with recreated conditions, virtual classrooms, recordings, digital books and test style applications. Additionally, understudies' working propensities can be audited by instructors to recognize those battling and to propose cures, limiting the odds of their dropping out (Simon, 2017) [7].

Horizon Report (2016) [2] described learning investigation as "an instructive methodology of web examination coordinated next to learner see, a procedure of collecting and breaking down realities of individual understudy connections in web-based learning exercises." The new fascination in learning investigation returns more extensive premiums in "Huge Information" and Instructive Information Mining (EDM). Huge information has been depicted as a comprehensive term

for any gathering of informational indexes so huge and complex that it winds up hard to process them utilizing conventional information handling applications, whereas Instructive Information Mining (EDM) portrays an exploration field worried about the utilization of information mining, machine learning and insights to data created from instructive settings.

The fascination in learning examination mirrors the expanded utilization of investigation in different segments. Grocery stores, for instance, investigate information on obtaining designs, the viability of showcasing efforts, with the end goal to target spending and oversee stock levels. It has likewise been recommended that examination helped Germany win the 2014 World Glass. Be that as it may, the utilization of investigation in a learning setting presents challenges which are not pertinent in different cases.

The key recipients of learning examination include

1. Institutional directors accepting choices on issues, for example, advertising and enrolment or proficiency and adequacy measures.
2. Individual students to consider their accomplishments and examples of conduct in connection to other people.
3. Teachers and care staff plan supporting mediations with people and gatherings;
4. Functional gatherings, for example, course groups looking to enhance current courses or grow new educational modules contributions.

Learning examination is electronic estimations and announcing about understudy discovering that is planned to enable instructors to enhance the information and aptitude obtaining of understudies. This augments understudy learning possibilities while improving instructing and conveyance strategies. In spite of the fact that learning investigation application to training is generally new, logical controls have been utilizing it for more than forty years. Venture into grant was birthed by cutting-edge innovation and the information trails students leave while utilizing the web. The information gives a few advantages to help instructors and understudies.

The rise of learning investigation as a field has been ascribed to three primary drivers (Ferguson, 2012) [1] in particular:

1. Big information: the presentation of institutional databases and virtual learning conditions (otherwise called learning administration frameworks) implies that instructive organizations manage progressively a lot of information, and are searching for methods for utilizing these to enhance learning and educating.
2. Online taking in: the ascent of huge information in training is joined by an expansion in take-up of on the web and mixed instructing and learning, and by development in the number of students overall adapting casually utilizing open instructive assets (OERs) and enormous open online courses (MOOCs). There is in this way an overall enthusiasm for methods for improving learning in these settings.
3. National concerns: nations and worldwide groupings are progressively intrigued by estimating, showing and enhancing execution in instruction and are searching for approaches to improve learning and instructive outcomes with the end goal to profit society and the people inside it.

Learning examination, most basically, is the logical information behind the perceptions teachers have improved the situation hundreds of years and start making promptly with each new understudy. While educators can make forecasts and perceive designs, learning investigation enables instructors to complete a more profound plunge into the information, making associations that would be outlandish for the normal human mind to make. Learning examination helps teachers in the classroom promptly by creating educational programs mapping and learning mediations while anticipating conduct and deciding capabilities and customizing learning (Pardo and Lynch, 2017) [5].

Statement of Problem

Learners themselves, especially when beginning higher education, often have little concept of how they are performing in comparison with others, have gaps in essential knowledge, and lack key study skills. Giving students preferable information on how they are progressing and what they need to do to meet their educational goals is a major application of learning analytics.

Key concerns and challenges are corresponding with the plea of learning analytics (Siemens, 2014). For example, not all educational information is suitable and similar. Consequently, the effectiveness of data and its analysis are critical for causing functional summative, real-time, and predictive understanding.

Some other serious regard is associated with the use of educational information for learning analytics and entails how personal students' data are collected and stored as well as how they are analysed and presented. Therefore, what digital method they learn better with and what teaching style they prefer.

Aim and Objectives of the Study

The aim of the study investigates Learning Analytics for Students' academic performance in Faculty of Education, University of Port Harcourt. Specifically, the study intends to:

1. To find out the digital methods/ approaches students learn
2. To find out the various teaching styles students learn

Research Questions

1. What are the digital methods/approaches students prefer while learning?
2. What are the preferred styles of learning students like while learning?

Research Hypothesis

1. There is no significant difference among students on the use of digital methods/approaches students learn
2. There is no significant difference

Methodology

The study is a descriptive study research design to investigate learning analytics for students' academic performance in Faculty of Education, University of Port Harcourt. The Population comprised all Year 1 students from Faculty of Education with 8 departments, University of Port Harcourt offering Instructional Technology (EDU 102.2). A sample size of 300 students was used from six departments from Faculty

of Education, University of Port Harcourt. Stratified and purposive sampling techniques were used for the study. The instrument used to collect data from respondents was a structured questionnaire entitled Learning Analytics for students' academic performance in Faculty of Education, University of Port Harcourt (LASAPFEUPH) with 20 items. To ensure validity, the instrument designed by the researcher was given to experts in the field of Educational Technology and measurement and evaluation. This was done to help the researchers assess the quality of each item in the context of clarity, ambiguity and generality of the items. Their various comments and assessment gave the researcher the conviction that the instrument is appropriate and valid for the research. To determine the reliability of the instrument, test-re-test was applied; 20 copies of the instrument were administered on some students at two different occasions within three weeks. Their responses to the questionnaire item in the two separate responses were correlated to attain the reliability coefficient of 0.86. The responses from the questionnaire in Section B were weighted on the four-point Likert type scale: Strongly Agreed, Agreed, Disagreed, and Strongly Disagreed. Data obtained were analysed using Mean, Standard Deviation and ANOVA.
Presentation of Results

Research Question 1
What are the digital methods/approaches students prefer while learning?

Table 1

S/N	Digital Methods/Approaches Students Prefer	Mean	Standard Deviation
1	Accessing the web	3.68	0.46
2	Checking email	3.62	0.57
3	Gaming	3.58	0.59
4	Social networking	3.63	0.58
5	EBooks	3.28	0.77
6	Music application	1.90	0.80
7	Course maintenance	1.79	0.87
8	Movies	1.87	0.93
9	PowerPoints	2.60	0.30
10	Textbooks	3.55	0.57
	Average Mean	2.95	0.64

Table 4.3 shows that students prefer the following digital methods/approaches; Accessing the web (Mean= 3.68; SD= 0.46), Checking emails (Mean= 3.62; SD= 0.57), Gaming (Mean= 3.58; SD=0.59), Social networking (Mean=3.63; SD= 0.58), EBooks (Mean= 3.28; SD=0.77), PowerPoints (Mean=2.60; SD=0.30) and Textbooks (Mean=3.55; SD=0.57). An overall mean of 2.95 suggests that students preferred Accessing the web, checking emails, gaming, social networking, EBooks, PowerPoints and Textbooks while the others are not preferred by respondents for learning approaches.

Research Question 2
What are the various learning styles students prefer?

Table 2

S/N	Learning Styles	Mean	Standard Deviation
1	Visual learning style	3.85	0.38
2	Verbal learning style	3.84	0.42
3	Kinaesthetic	2.11	0.92
4	Active and reflective style	2.23	0.13
5	Sensing and Intuitive style	2.20	0.19
6	Sequential and global style	2.17	0.18
7	Aural learning style	1.63	0.71
8	Social learning style	2.39	0.19
9	Solidary learning style	1.67	0.86
10	Logical learning style	2.24	0.13
	Average Mean	2.43	0.41

Table shows that students prefer the following learning styles; Visual learning style (Mean= 3.85; SD= 0.38) and Verbal learning styles (Mean= 3.84; SD= 0.42). An overall mean of 2.43 suggests that students preferred visual learning style and verbal learning styles while the others are not preferred by respondents for learning styles.

Research Hypotheses
Research Hypothesis 1
There is no significant difference among students on the use of digital methods/approaches students learn

Table 3: One-way ANOVA of differences among students on the use of digital methods

Source	Sum of Sq	Df	Mn Sq	Fcal	Ftab	Remark
Between Gp		5		8.554	2.22	Reject Hypothesis (Significant)
Within Gp		294				
Total		*299*				

The result of one-way ANOVA reveals a significant difference exist in students' academic achievement and study habits across the 6 departments since the Fcal value of 8.554 is greater than Ftab of 2.22. The result is significant at 0.05 levels.

Table 4: Post Ho, Multiple Comparison Test using Scheffe model

Variables	N	Mean
Adult and Non- formal Education (DAE)	50	31.44a
Human Kinetics	50	32.52ab
Educational Psychology	50	32.54ab
Curriculum Studies/Educational Technology	50	33.33abc
Educational Management	50	34.22bc
Educational Foundation	50	35.24c

Mean scores with different alphabets down the column are significantly different.

Table 4 is the Post Hoc multiple comparison tests using Scheffe. This shows actually where the differences in the use of digital methods lie. The table shows that significant differences exist in the mean score of students in DAE (M=31.44) and EDM (34.22). Also, significant difference exists between the mean preference of digital method of students in DAE (M=31.44) and EDF (M=35.24). A significant difference exists in preference of digital method of students in KHE (M=35.22) and EDF (M=35.24). A significant difference also exists in the digital method of students in EDP (M=32.54) and EDF (M=35.24).

Hypothesis 2

There is no significant difference among students in their various learning styles.

Table 5: ANOVA of differences learning styles

Source	Sum of Sq	Df	M_nS_q	Fcal	Ftab
Btw group	1614.537	5	322.907	19.232	2.22
Within group	4936.300	294	16.790		
Total	*6550.837*	*299*			

The result of one-way ANOVA reveals a significant difference exist in students learning styles across the 6 departments since the Fcal value of 19.232 is greater than Ftab of 2.22. The result is significant at 0.05 levels.

Table 6: Post Ho, Multiple Comparison Test using Scheffe model

Departments	N	Mean
Human Kinetic (KHE)	50	21.9000
Adult and Non- Formal Education	50	22.5200
Curriculum Studies/Educational Technology	50	22.8000
Educational Psychology	50	24.5200
Educational Foundation	50	25.7400
Educational Management	50	28.6600

Mean scores with different alphabets down the column are significant at 0.05levels.

The Scheffe's model helps to separate means and show where actually the differences in the various preferred learning styles lie.

Discussion of Findings

Research Question 1: What are the digital methods/approaches students prefer while learning?

The examination found that understudies incline toward the accompanying computerized strategies/approaches; Getting to the web, browsing messages, gaming, long range informal communication, Digital books, Power Points and Reading material.

The discoveries of the present examination are in concurrence with those of Snow, Jackson, Varner & McNamara (2013) found that understudies who played PC round of Newton's mechanics could all the more effectively answer addresses identified with question development and power than the individuals who did not play such an amusement.

Yoon (2014) demonstrated that PC amusements could upgrade understudies' execution on variable based math getting the hang of, perusing capacity, critical thinking, thinking capacity, methodologies arranging capacity, participation capacity and self-learning control capacity and displayed incredible advantages on the learning inspiration and learning accomplishment.

Research Question 2: What are the preferred styles of learning students like while learning?

The investigation found that understudies favoured Showing technique, Discourse strategy, Guided Critical thinking, Recreations/re-enactments, Helpful learning, flipped learning, mixed learning and Conceptualizing as the strategies for training they lean toward.

The discoveries of the present examination are in concurrence with those of Unal (2017) [10] their outcome demonstrated that scholastic accomplishment in exercise started with analysis or slide show was higher than exercise starting with address technique.

Additionally, Skutil (2016) [8] attested that maintenance level in exercise starting with examination and slide exhibition was higher than that of starting with address. Since, individuals recollect 10% of what they read, 20% of what they heard, 30% of what they saw and 90% of what they had a hands-on understanding.

Besides, Sadeghi, Mehdi, Sadeghat and Ahmadi (2014) [6] stated that both address and mixed techniques fundamentally raise the understudies' learning. Since the understudies' fulfilment and cost adequacy in the mixed technique was more than address strategy.

Conclusion

The accompanying ends were made by the analyst

1. It was additionally discovered that understudies incline toward exhibition, exchange, guided-critical thinking, diversion/re-enactments, and helpful, flipped, mixed and conceptualizing instructing styles.
2. They favoured visual and verbal learning styles

Recommendation

In view of the end, the scientist suggests that

1. Teachers should disclose to understudies why different strategies for educating ought to be utilized in the classroom and the advantages they will get from them.
2. Teacher's instructing strategies ought to be good with the learning styles of understudies.

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