

# **An Exploratory Case Study: the sudden introduction of Internet Protocol Television (IPTV) in an ODL Accounting Program. The University of Papua New Guinea Open College (UPNG OC) experience.**

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## **Abstract**

The sudden introduction of IPTV provided the opportunity to cautiously appraise the role of technology to support the predominantly print form of distributed learning within the UPNG OC network.

Towards appraising and evaluating the IPTV this research question was posed; does the IPTV Live Broadcast have an effect on the Accounting 2 DE learners' academic performances? To answer this question the quasi - experimental design was employed and the t - test was used to compare the mean aggregate scores of the ODL students using instructionally designed print materials and those using instructionally designed print and supplemented by IPTV Live Broadcast.

The results revealed that there was a significant difference between the means at both  $p = 0.10$  and  $p = 0.05$  significance levels when comparing the mean scores of the students who passed with respect to their (1) Assignment scores, (2) Term End Examination (TEE) scores and (3) Total Marks. And since the result was consistent across the Assignment, TEE and the Total Scores it is inferred that the IPTV did not have a positive effect on the students who were exposed to it, because it was not fully integrated into the course delivery package.

Finally recommendations for policy makers, academics and the Course Development Team are offered with respect to the findings of this study with the hope that relevant actions are taken to improve and establish an economically prudent and appropriate strategy for effective use of technology to support distance learning courses among a network of campus and centre sites in Papua New Guinea.

## **Introduction**

Within a context of rapid technological change and shifting market conditions, the Papua New Guinea Higher Education system is challenged with providing increased educational opportunities without increased budgets (The National. 2014). Most public - funded educational institutions in Papua New Guinea (PNG) are answering this challenge by developing Distance Education (DE) or Open & Distance Learning (ODL) programs.

The University of Papua New Guinea Open College (UPNG OC) as the sole entity responsible for the facilitation of ODL programs for University of Papua New Guinea (UPNG), have decided to employ Moodle (Minol.et.al. 2013) and now while the UPNG on the other hand chooses to implement the Internet Protocol Television (IPTV).

This implies that UPNG OC may in the near future also employ the IPTV together with the print, Moodle and face – to – face. So unlike Minol et.al (2013) who investigated e – learning readiness, this study concentrates on evaluating the IPTV and its impacts if there is any on student performances. Though there has been some positive feedback about the Broadcast, its pedagogical effect on the ODL students has to be elucidated before any serious commitment can be made.

This study hopes to provide some recommendations for UPNG OC decision and policy makers and the Course Team on what they could do to utilize this technology to serve the students' learning needs.

It would be reasonable before we begin to define what IPTV is. Well, there is quite an array of definitions with respect to its use (Yuzer, et.al. 2011) and its technical features (Anderson, N. 2006) but here the authors prefer the definition by Wikipedia, which defines it as:

“a system through which television services are delivered using the internet protocol suite over a packet - switched network such as a Local Area Network (LAN) or the Internet, instead of being delivered through traditional terrestrial, satellite signal, and cable television formats. Unlike downloaded media, IPTV offers the ability to stream the media in smaller batches, directly from the source. As a result, a client's (learner's) media player can begin playing the data (such as a movie) before the entire file has been transmitted. This is known as streaming media.”

Otherwise the official definition approved by the International Telecommunication Union focus group on IPTV as reported by Pezzi (2010) is:

“IPTV is defined as multimedia services such as television, video, audio, text, graphics and data delivered over IP based networks managed to provide the required level of quality of service and experience, security, interactivity and reliability.”

## **Aims of the Case Study**

The study aims to;

1. Elucidate if the sudden introduction of the Live Broadcast had an effect on the ODL student's academic performances.
2. Provide recommendations for UPNG Open College decision and policy makers.

## **Methods**

The research design employed both qualitative and quantitative techniques in collecting and analysing the data. Otherwise due to the nature and characteristics of the population from which the samples are drawn from; especially to answer the question, the Quasi – Experimental Design was more appropriate for this particular study.

The Quasi – Experimental Design allows for comparisons of naturally occurring treatment groups (Keong, F.K., et.al. 2013 and Donkor, 2010); which are fairly clear – cut, though not set up for research purpose as in this study. Therefore the experimental treatment was not controlled by the researcher, but the researcher has some control over when to measure the ‘outcome variables’ in relation to exposure to the ‘independent variable’ (Punch, K. F. 1998).

The outcome variable (final cumulative assessment scores and grades) here would be obtained after the students (subjects) sit for the Term End Examination (TEE), after being exposed to the independent variables which are; (1) Live Broadcast Sessions + Print and (2) Instructionally designed print materials, thus the whole study is in no way controlled by the researcher.

Generally, there are three ways to assign participants to experimental conditions: a between – subjects design (sometimes called an independent – group design), a within – subjects design (also called a repeated – measures design), and a mixed design (Vernoy & Kyle, 2002). Each of the learners selected for the study participated in only one of the two experimental conditions making the study a between – subjects design. According to Vernoy and Kyle again, a between – subjects design requires that “each level of each independent variable has different participants; thus, there is a distinct difference between each level of the experiment because each person participates in one and only one level”.

## **Sample, Population and Subjects**

The population sample depended on the students who were actually present throughout the Live Broadcast (IPTV) Sessions and the other ODL students who completed the program out in the Campuses or Study Centres. It depended on the total number of students who actually sat the Term End Examination (TEE).

The total number of students who sat the TEE was 280. And from this student population the samples were drawn from; (1) ODL students who were exposed to the IPTV (n = 55) plus the Print and (2) ODL students in the Campuses or Study Centres who depend predominantly on Print (Control Group: n = 225).

## Data Analysis

The data analysis involved the comparison of scores, especially the mean scores achieved after the cumulative assessments were completed. The study employed the independent t – test at both p = 0.10 and p =0.05 levels of significance, which is consistent with data analysis employed by; Keong, et.al (2013), Donkor (2010) and Punch (1998).

## Results & Discussions

Before a discussion of the results can ensue, it would be just to note that certain limitations of this study may have affected the overall results. Prominently, the sample sizes were uneven, since the sample size of the students using predominantly instructionally designed print was larger than that of those who were using the instructionally designed print materials supplemented by the IPTV Live Broadcasts. Approximately 80% (n = 225) compared to 20% (n = 55) of the total population size (N = 280).

Otherwise it is plausible to continue on with these following hypotheses, formulated to answer the research question posed:“does the IPTV Live Broadcast have an effect on the Accounting 2 DE learners’ academic performances?”

1. The students’ performance in both the instructionally designed print media and exposure to the IPTV was the same with respect to the aggregate mean scores.
2. The students’ performance in both the instructionally designed print media and exposure to the IPTV was the same with respect to the pass mean assignment scores.
3. The students’ performance in both the instructionally designed print media and exposure to the IPTV was the same with respect to the pass mean TEE scores.
4. The students’ performance in both the instructionally designed print media and exposure to the IPTV was the same with respect to the pass mean total scores.

Although, Table 1 shows that none of the students using the instructionally designed print and supplemented by the IPTV were awarded a Credit Grade, 2% of them were awarded Distinction (Di) and 40% were conceded to have passed the course. While on the other hand only 28% of the students using only the print passed (Pa), but otherwise both groups of students were almost even with respect to their percentage attrition rate (refer to Table. 1). So it can be assumed that there were no differences in their overall performances.

**Table 1. Some descriptive statistics on retention and attrition rates.**

| Grade Awarded             | Print Only<br>(n = 225) | IPTV + Print<br>(n = 55) |
|---------------------------|-------------------------|--------------------------|
| <b>Di (Distinction)</b>   | 3 (1%)                  | 1 (2%)                   |
| <b>Cr (Credit)</b>        | 14 (6%)                 | 0 (0%)                   |
| <b>Pa (Pass)</b>          | 62 (28%)                | 7 (13%)                  |
| <b>CP (Conceded Pass)</b> | 51 (23%)                | 22 (40%)                 |
| <b>F (Fail)</b>           | 95 (42%)                | 25 (45%)                 |
| <b>Total</b>              | <b>225 (100%)</b>       | <b>55 (100%)</b>         |

The results in Table 2 seem to support this assumption, with respect to their performances on the assessable items (Assignment and the TEE) and the aggregate or total cumulative scores (Assignment + TEE). The mean score for the respective groups of students in the Assignment is the same; approximately 20, which is also the same for TEE,

and the Aggregate/Total Marks, respectively approximately 20 and 40 (refer to Table 2). Table 2 again shows that most students using predominately print failed the assignment and the TEE.

Thought there are doubts here, the t – test result still asserts the earlier assumption madewhen comparing the aggregate scores as there were no significant difference found ( $t(278) = 1.65$ ) at  $p = 0.10$  and  $p = 0.05$  significance levels.

**Table.2. Descriptive Statistics (Print: n = 255; IPTV: n = 55)**

| Mode  | Mean  | SD    | Median | Mode  | Max   | Min  | Assessment Type |
|-------|-------|-------|--------|-------|-------|------|-----------------|
| PRINT | 19.90 | 7.09  | 21.38  | 00.00 | 30.00 | 0.00 | Assignments     |
| IPTV  | 18.90 | 5.34  | 20.63  | 22.50 | 25.88 | 0.00 |                 |
| PRINT | 21.79 | 12.63 | 22.40  | 0.00  | 54.60 | 0.00 | TEE             |
| IPTV  | 19.50 | 9.96  | 19.95  | 20.65 | 52.85 | 0.00 |                 |
| PRINT | 41.69 | 16.46 | 43.20  | 30.80 | 76.63 | 4.20 | Total Marks     |
| IPTV  | 38.40 | 12.40 | 40.33  | 56.10 | 76.10 | 7.00 |                 |

Now again though, the research design is not exclusively a quasi – experimental design, because as it is a “between subjects” design requires that “each level of each independent variable has different participants (Vernoy & Kyle, 2002). Otherwise the results of the earlier test conducted has established that the 2 groups of students are homogenous, inferring that with respect to hypothesis 1, it can be safely stated thatthe students’ performance using both the instructionally designed print and those supplementing print with the IPTV were the same.

**Table. 3. Presents the Descriptive Statistics of the Print (n =130) and IPTV ( n = 30)**

| Mode  | Mean  | SD   | Median | Mode  | Max   | Min   | Assessment Type |
|-------|-------|------|--------|-------|-------|-------|-----------------|
| PRINT | 23.18 | 3.49 | 24.00  | 26.25 | 30.00 | 13.50 | Assignments     |
| IPTV  | 20.59 | 3.22 | 21.94  | 22.50 | 25.88 | 12.00 |                 |
| PRINT | 30.08 | 8.50 | 29.40  | 32.20 | 54.60 | 14.00 | TEE             |
| IPTV  | 26.48 | 7.09 | 25.73  | 33.60 | 52.85 | 18.20 |                 |
| PRINT | 53.26 | 9.13 | 52.23  | 57.05 | 76.73 | 40.03 | Total Marks     |
| IPTV  | 47.07 | 7.74 | 44.92  | 56.10 | 76.10 | 40.03 |                 |

And since the sampled population has been rendered homogenous, the mean scores of those who passed were taken and compared against their; (1) Assignment, (2) TEE and (3) Aggregate Total scores to satisfy hypotheses 2, 3 & 4 respectively. A total sample size of 160 students passed (refer to Table.3). And from these 130 used instructionally designed print and 30 students used print supplemented with IPTV.

The test result showed there existed a significant difference between the two groups' mean scores (Table. 3), because the calculated t – value obtained were greater than that for (1) Assignments ( $t(158) = 3.9$ ), (2) TEE ( $t(158) = 2.4$ ) and (3) Total Aggregate Scores ( $t(158) = 3.8$ ) at both  $p = 0.10$  and  $p = 0.05$  significance levels.

The results show that the performances of both groups of students using either instructionally designed print or print supplemented by the IPTV are not the same. And it is now plausible to infer that those using the instructionally designed print materials fared better than those using the instructionally designed print supplemented with IPTV.

## Conclusion

It can be asserted that, before we can employ the IPTV for delivery of learning more similar studies should be carried out in other study centres before we can draw a conclusive conclusion. And although there are some limitations acknowledged in this study, otherwise for the purpose of this exercise; we can safely assume and conclude that;

There was a significant difference found with respect to the means of those who passed, which was consistent across the Assignment, TEE and the Total Scores and towards answering the research question posed, the IPTV did not have a positive effect on the students who were exposed to it. Because it was not fully integrated into the course delivery package.

And so, for the effective use of educational technology the authors would like to propose to the UPNG OC management and the Course Development Team;

- to fully integrate all technological mediums into the course delivery package through engaging in careful planning and a focused understanding of course requirements, student needs and media characteristics to provide a rich environment for learning, and improving quality of the course delivery strategy.

With that “cautiously” at this point in time we do not envisage that it will be used for full delivery of learning content as yet. But that relevant actions are taken to improve and establish an economically prudent and appropriate strategy for effective use of technology to support distance learning courses among a network of campus and centre sites in Papua New Guinea.

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