IMPACT OF SUBJECT SPECIALISTS ON TEACHING: APPLICATION TO PHYSIOLOGY

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Abstract. The study investigated the impact of teachers on the teaching of a physiology course to performing arts students of the University of Ilorin. Questionnaires and personal observations were used to assess students' perception of the course and performance, the examination results in the two years before and after the takeover of the course by physiology teachers were obtained and analysed. The results showed that the students appreciated the teaching by core physiology teachers than the teaching by performing arts teachers and the initial phobias of the students were significantly doused. The average performance by the students did not change significantly and this further justified the taking over of the course by physiology teachers.

Keywords: performing arts, physiology, questionnaire, teachers

Introduction

To educate its students about the use of some parts of the body to perform artistic skills like dancing and music, the Department of Performing Arts

of the University of Ilorin created a course titled Physiology and Anatomy for the Performing Arts with course code PFA 207. This course included contents such as definitions of basic Physiology and Anatomy terms, Organization of body structure, bones and joints, organs of phonation and articulation, blood, eye, ear, respiratory and muscular systems.[1] The course has been taught since the inception of the department (more than fifteen years ago) by Performing Art lecturers. However, the University of Ilorin started a process of restructuring which necessitated that special courses in a discipline be taught by specialist in each of those courses. Thus the course was recoded as a Physiology course[1] and the Department of Physiology was mandated to teach the Performing Arts Students the course.

The staff and students of the departments of the performing arts felt that the Physiology lecturers might not be able to teach what is required to the Performing Arts students or that the students will be overloaded with unwanted facts (too much basic Physiology) and that the medical terms that will be used might be too much for the students to comprehend (Jarvis, 2006). We from physiology faced the uphill task of how to teach Physiology in simple term to students without background knowledge in science or biology.

In the present article, we describe methods used to teach the Performing Arts students, the results of a survey after the teaching, the student's evaluation of their art teachers and Physiology teachers and the experience just before and after the Physiology lecturers took over the course. We also used the four years examination results sheets to assess the students' performance under the performing arts and physiology teachers.

Methods

A total of 85 Performing arts students took the physiology course in 2011; sixty eight were offering the course for the first time, three for the second time and two for the third time. The students were earlier sensitized to the

fact that physiology lecturers will takeover the teaching of the course. In preparing notes and instructions for the course we consulted the Internet and textbook on Human Anatomy and Physiology (Marieb & Hoehn, 2006). We also obtained processed cadaver skull and monographs for visual demonstrations to students.

In his first contact, the lead lecturer pacified the students and tried to paint physiology as an interesting course, they were given enough opportunity to ask as many questions as possible as well as trying to explain the terms in simple English language (Figlio & Kenny, 2007). The subsequent lectures lasted for a semester (15 weeks). Therefore we had 12 hours contact with the students. During the last lecture, students were given questionnaires prepared by us and this was used to assess their understanding of Physiology and their views about Performing arts teachers. The questionnaires contained eighteen questions each with five- point scale (i.e. strongly agree (SA), Agree (A), Neither Agree Nor Disagree (NAND), Disagree (D) and Strongly disagree (SD). The eighteen questions were divided into three sections namely; part A assessing students perception of the course and its usefulness, part B for students to assess their lecturers (Prashyng, 2008) and part C to provide any other comment/suggestions (Blalock, 1970).

A total of forty six students voluntarily agreed to fill the questionnaires, others were also willing to complete the questionnaires but only 46 questionnaires were taken to the class for the survey. The student class representative assisted in distributing the questionnaires and collecting them back. The questionnaires were filled anonymously by the students and we processed the responses. The 2009 and 2010 sessional results of the students in the course were obtained from the performing art department while the 2011 and 2012 results (handled by physiology teachers) were supplied by the physiology department. These results were analysed to find the range, mean, significance level and the co-efficient of variation of the results.

Statistical methods

Descriptive statistics was used to determine the distribution or pattern of each of the items (variables) involved in the questionnaire designed for this enquiry. Cronbach's α (alpha) which is a coefficient of reliability was also used to analyze the data. Cronbach's alpha is commonly used as a measure of the internal consistency or reliability of a psychometric test score for a sample of examinees (Santos, 1999). Cronbach's alpha (α) can be defined as

$$\alpha = \frac{K\bar{c}}{(\bar{v} + (K-1)\bar{c})} \tag{1}$$

where K is the number of items, $\bar{v}$ the average variance, and $\bar{c}$ the average of all covariances between the components across the current sample of persons.

The *standardized Cronbach's alpha* can be defined as

$$\alpha_{\text{standardized}} = \frac{K\bar{r}}{(1 + (K-1)\bar{r})} \tag{2}$$

where K is as above and $\bar{r}$ the mean of the $K(K-1)/2$ non-redundant correlation coefficients (i.e., the mean of an upper triangular or lower triangular, correlation matrix).

Cronbach's alpha is believed to indirectly indicate the degree to which a set of items measures a single unidimensional latent construct. The average intercorrelation among test items is usually affected by skew just like any other average. However, the modal intercorrelation among test items will be equaled to zero when the set of items measures several unrelated latent constructs, the average intercorrelation among test items will be greater than zero in this case. Indeed, several investigators have shown that alpha can take on quite high values even when the set of items measures several unrelated latent

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constructs (Zinbarg et al, 2006; McDonald, 1999; Cortina, 1993). Alpha is most appropriate for this survey under study since the items measure different substantive areas within a single construct.

Results and discussion

The survey covered more than fifty percent (54%) of the students that offered the course in 2011. The Analysis of result of the survey showed that the alpha co-efficient for the main seventeen questions is 0.695 (Table 1) suggesting that there was consistency in the responses of students to the questions posed. Table 2 also showed that initial phobia for the course was the most consistent attributes that the students had. This is because the Cronbach's Alpha was highest (0.719) when phobia is deleted from the items. Phobia also has the least item-total correlation value of (-0.013). This implies phobia is not measuring the same construct as the rest of the items in the scale are measuring. (Gliem & Gliem, 2003) However, 69.9% of the students later found the course interesting and felt that the teaching methods of the physiology lecturers were quite different from those of the Performing Art teachers.

Table 1. Reliability statistics for overall items

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.695	.713	17

Sectional analyses of how the students felt about the course showed more variability as the reliability statistic (Table 3) produced 0.484. This section consisted of 12 questions and the students' responses lacked strong agreement as the section has the lowest reliability coefficient. This section will also account for the highest Cronbach's Alpha if question about initial

phobia is deleted. Table 4 shows that the initial phobia is a strong factor (Crobach Alpha of 0.516) for the students and that the students also felt strongly that the teaching method of the Physiology Teachers were different from the art teachers (Crobach Alpha of 0.500). In the second section (Table 5) where students were asked to assess their previous Art teachers (of the course) as well as physiology lecturers, there were very strong agreements (Crobach Alpha 0.733) in the choice of responses given by the students. Many students agreed that the course was well organized and that the physiology lecturers were very enthusiastic in giving their lectures. This is shown in Table 6 by a score Crobach Alpha of 0.714 and 0.743 respectively if questions on "Course Well Organised" and "Lecturer enthusiastic" are deleted individually from the total items. The overall Crobach Alpha is given as 0.733 (Table 5) which indicates an acceptable reliability level. Table 7 also showed that there were strong positive correlation between the lecturers being well prepared and the lecturers being audible and understandable (0.605) as well as the lecturers pace (of delivering lectures) being satisfactory and being understandable (0.509). This generally showed that the students were able to follow the lectures and this is partly due to the lecturers' preparation, enthusiasm, audibility and method of lecture delivery.

Table 2. Item-total statistics for overall items

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Had Initial phobia	38.91	77.859	-.013	.336	.719
Course is tough	39.48	73.233	.241	.261	.686
Did not understand the Course	38.83	75.702	.127	.314	.698
Course is interesting	39.85	75.865	.116	.309	.699
Phobia was allayed	38.78	65.463	.402	.346	.666
Enjoy the teaching	39.74	75.708	.153	.380	.694

Course was demystified	38.61	70.021	.221	.286	.694
Enjoy the teaching method	39.72	68.563	.499	.574	.659
Teaching method was different from PFA Lecturers	40.11	76.766	.102	.346	.699
Course is relevant to PFA	40.20	75.805	.216	.534	.689
Course should be retained for PFA	39.61	70.332	.366	.666	.673
Course should be taught by PHS Lecturers	39.30	71.194	.258	.429	.686
Course was well Organized	39.63	67.794	.478	.476	.659
PHS Lecturers prepared well	40.11	69.877	.585	.572	.658
PHS lecturers were enthusiastic	39.65	73.787	.211	.397	.690
PHS Lecturers were audible	39.72	68.607	.554	.631	.656
Pace of lecture delivery was satisfactory	39.76	67.697	.588	.572	.651

Table 3. Reliability statistics for the students section

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.484	.490	12

Table 4. Item-total statistics for the students section

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Initial phobia	27.78	35.463	.010	.235	.516
Course was tough	28.35	33.699	.190	.190	.461
Did not understand the Course	27.70	34.616	.131	.259	.475
Course is interesting	28.72	33.896	.180	.200	.463
Phobia was allayed	27.65	27.565	.401	.252	.379
Enjoy the teaching	28.61	35.621	.085	.341	.485
Course was demystified	27.48	31.811	.145	.184	.481
Enjoy the teaching method	28.59	31.670	.361	.355	.416
Teaching method was different from PFA Lecturers	28.98	36.600	.013	.202	.500

Course is relevant to PFA	29.07	34.107	.304	.404	.444
Course should be retained for PFA	28.48	31.544	.331	.540	.421
Course should be taught by PHS Lecturers	28.17	33.436	.134	.329	.478

Table 5. Reliability statistics for the lecturers section

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.733	.748	5

Table 6. Item-total statistics for the lecturers section

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Course was well Organized	8.76	10.364	.439	.200	.714
PHS Lecturers prepared well	9.24	11.075	.623	.441	.652
Lecturer were enthusiastic	8.78	11.285	.357	.144	.743
PHS Lecturers were audible	8.85	10.576	.565	.438	.661
Pace of lecture delivery was satisfactory	8.89	10.499	.553	.331	.665

Table 7. Inter-item correlation matrix for the lecturers section

	Course was well Organized	PHS Lecturers prepared well	PHS Lecturer were Enthusiastic	PHS Lecturers were audible	Pace of lecture delivery was satisfactory
Course was well Organized	1.000	.384	.250	.331	.349
PHS Lecturers prepared well	.384	1.000	.326	.605	.455
PHS Lecturer were Enthusiastic	.250	.326	1.000	.223	.293

	Strongly Agreed %	Agreed %	Neutral %	Disagreed %	Strongly Disagreed %
PHS Lecturers were audible	.331	.605	.223	1.000	.509
Pace of lecture delivery was satis-factory	.349	.455	.293	.509	1.000

Table 8. Distribution of items by their Likert scale percentages

	Strongly Agreed %	Agreed %	Neutral %	Disagreed %	Strongly Disagreed %
Initial phobia	15.2	30.4	15.2	21.7	17.4
Course was tough	10.9	60.9	8.6	17.4	2.2
Did not understand the Course	4.3	34.8	15.2	43.5	2.2
Course is interesting	23.9	58.7	8.7	2.2	6.5
Phobia was allayed	13	32.6	41.3	10.9	2.2
Enjoy the teaching	15.2	60.9	21.7	0	2.2
Course was demystified	10.9	32.6	41.3	8.7	6.5
Enjoy the teaching method	23.9	47.8	15.2	8.7	4.3
Teaching method was different from PFA Lecturers	45.7	32.6	13.1	8.7	2.2
Course is relevant to PFA	43.5	37	15.2	4.3	0
Course should be retained for PFA	26.1	39.1	15.2	8.7	10.9
Course should be taught by PHS Lecturers	26.1	23.9	28.2	10.9	10.9
Course was well Organized	21.7	54.3	4.4	10.9	8.7
PHS Lecturers prepared well	32.6	54.3	8.7	2.2	2.2
PHS lecturers were enthusiastic	19.6	50	26.1	4.3	0
PHS Lecturers were audible	19.6	52.2	17.4	8.7	2.2
Pace of lecture delivery was satisfactory	17.4	60.9	17.3	2.2	2.2

Table 8 shows the responses to each of the 17 basic questions. Forty five percent of the respondents strongly agree/agree that they had phobia for the course while only 17.4% disagreed. Seventy one percent strongly agreed/agreed that they thought that the course was tough while forty four percent believed that they should be able to understand the course. Eighty three percent believed that the introduction taken by lead lecturer was interest-

ing while only 2% disagreed. Forty six percent of the respondents strongly agreed/agreed that their phobia for the course was allayed at the end of the course while forty percent (40%) neither agreed nor disagreed. Seventy six percent of the respondents enjoyed the teaching by physiology lecturers. Forty four percent believed that the physiology lecturers demystified the course while another forty percent could not say yes or no. Seventy two percent of the students sampled enjoyed the teaching method adopted by the physiology lecturers and seventy eight percent of the respondents believed that the teaching method was different to that used by the art teachers. Eighty percent of the respondents believed that the course has relevance to the discipline of Performing Arts but only half (50%) of the respondents wants the course to be retained while 28% was indifferent. Likewise, majority of the respondents wants the physiology lecturers to continue with the teaching of the course. They also believed that the teachers organized the course instruction very well and are (87%) very well prepared to handle the course. About 70% of the respondents believed that the physiology lecturers were enthusiastic, audible and understandable. A very high percentage (78%) believed that the pace of lecture delivery was satisfactory.

Table 9. Yearly based performance of students during the performing arts and physiology teachers' periods

Teachers (year of sessional results)	No of students	Range	Minimum score	Maximum score	Mean ± SEM
PFA (2009)	82	43.00	25.00	68.00	50.09±1.07
PFA (2010)	56	66.00	14.00	80.00	49.77±2.09
PHS (2011)	85	59.00	14.00	73.00	46.64±1.18*
PHS (2012)	105	53.00	20.00	73.00	46.43±1.14

Responses to the 18th question which asked whether the students have any other comments/suggestions afforded the students the opportunity to ex-

patiate on earlier choices in the previous or to make new suggestions. Students mostly identified the contribution of each of the two physiology lecturers (Prashying, 2009) and showed that one performed better than the other (five respondents), they also wished that the amount of lecture note that they received be reduced, that the final examination be multiple choice questions (MCQ) or that a special textbook be developed for the course. The analysis of the sessional results (Table 9) of the students showed that the lowest scores obtained were 14% for the two sets of results graded by Performing art and physiology teachers while the highest grade was 80% and 73% for performing art and physiology teachers respectively. The overall mean scores for the students during the performing art teachers' period was 49.96% while it was 46.52% during the physiology teachers' period (Table 10). The mean score was therefore slightly lower during the period of physiology teachers probably because of the effect of the initial phobia and the fact that teacher from the medical school usually use close marking system. This was further highlighted by the co-efficient of variation which showed that the scoring by physiology teachers was slightly less varied and the distribution was more normal than those by the Performing art teachers.

Table 10. Summary of the performance of students during two years period under performing arts and physiology teachers

Teachers	No of students	Mean ± SEM	Variance	Coefficient of variation
PFA	138	49.96±1.06	154.18	24.85
PHS	190	46.52±0.82*	128.48	24.37

PFA= Performing Arts, PHS= physiology, *p< 0.05 compared with PFA

Conclusion

The observation presented here is the very first assessment of students perception of the course PHS 211. It provided diagnosis and summative as-

sessment of the students offering this course. The results obtained were due to competence exhibited by the physiology lecturers. This was easily detected by the students and it helped in increasing our success rate. The results also showed that it is good for experts to teach specialized courses, although the students had slightly low mean scores during the period of physiology teachers, we believed that this performance was good in view of the prevailing phobia and also if the students that were taught by art teachers were asked to be assessed by the physiology teachers they may not perform very well. Therefore, retaining courses for members of a department who are not specialists in such an area may bolster ego of the parent department and hide some practises. Nevertheless programmes will benefit in terms of ranking and students will get better understanding of concepts when experts teach a course.

NOTES
1. http://www.unilorin.edu.ng/courseware/physiology/PHS%20211%20COURSEWARE.pdf

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