

This paper was downloaded from

The Online Educational Research Journal
(OERJ)

www.oerj.org

OERJ is an entirely internet-based educational research journal. It is available to anyone who can access the web and all articles can be read and downloaded online. Anybody can submit articles as well as comment on and rate articles. Submissions are published immediately provided certain rules are followed.

It doesn't matter where I sit..... does it?

The Effect of Changing Classroom Seating Position on
Student Performance and Motivation Factors.

Jan Martin

Department of Biomedical Science and Physiology, School of Applied Sciences,
University of Wolverhampton, Wolverhampton, WV1 1SB, United Kingdom.

email j.martin@wlv.ac.uk

phone +44 1902 321154

fax +44 1902 322714

Abstract

This study examined the effect of changing classroom seating position on student performance and motivation factors. The investigation used four teaching sessions, each with 13 undergraduate year two students. For the first session students were given a choice of seating and for the second session seating was assigned to the opposite classroom position i.e. students were moved from front-to-back and vice versa. Seating for sessions three and four was the same as for sessions one and two respectively. Following a 20 minute lecture on a biomedical science topic, students were asked to complete calculations within a 30 minute period and their performance and output was measured. A standard 22-item version of the Intrinsic Motivation Inventory questionnaire with four separate subscales was used to measure student's interest/enjoyment, perceived competence, perceived choice and pressure/tension while carrying out the calculation questions. These results support an association between student performance and seating position and showed that for some students, changing seating position from their choice seat to an assigned seat had a significant detrimental effect on output, performance and perceived competence along with an increase in perceived pressure. Accordingly, prudence should be employed if advising students to change seat position in an attempt to enhance learning.

Key words: Seating position, Academic performance Classroom, Motivation factors

1. Introduction

The principle that the best seats in the theatre are those towards the front had its foundations over 2000 years ago when the Roman Colosseum hierarchy of seating offered the '*best seats on the front rows on or just behind the podium*' (Hopkins 2011). Whilst seating position had therefore been well established within the context of theatrical performances, the importance of seating position within classroom ecology was first recognised just over a century ago by Griffiths (1921) who identified three distinct performance zones: very close to the front (lower grades than towards the front); towards the front (best grades) and the back rows (low performance).

A few decades later, subsequent studies served to reinforce the concept of a positive relationship between front seat position and good performance (Brooks and Rebata 1991). While this may be due to environmental factors such as better visibility and improved ability to hear at the front of the classroom it is also thought to be due, at least in part, to increased: attendance (Stires 1980), attention (Schwebel and Cherlin 1972), creativity (Totusek & Staton-Spicer 1982), interaction (Adams and Biddle 1970), participation (Cinar 2010) and motivation (Burda and Brooks 1996). Thus reinforcing the notion that academically stronger students who demonstrate these behavioural attributes, choose to sit towards the front while weaker students choose to sit at the back.

Randomly assigning seats would therefore be expected to negate possible influences of these student behavioural attributes and this has indeed been demonstrated (Wulf 1977; Levine et al. 1980; Benedict and Hoag 2004) with the exception of one study which showed that seat location still impacted greatly on student performance even if seats were randomly assigned (Perkins and Wieman 2005).

While many studies therefore support the hypothesis that seat location is related to academic performance, the relationship is not well established as several other investigations refute this premise and have demonstrated that seat location has no effect on student achievement whether seats are self-selected (Armstrong and Chang 2007) or are randomly assigned (Kalinowski and Taper 2007).

Although other studies have investigated the effects of seat location on factors such as performance (Brooks and Rebata 1991), motivation (Burda and Brooks 1996) and enjoyment (Pavlika 2007); none that the author is aware of, have studied the potential influence of both choice and assigned seating on student interest and perceptions of competence, choice and tension.

The aim of this study was therefore to investigate possible effects of seat location, not only on output and performance, but also on student perceived competence, choice, pressure and enjoyment.

Methods

Four teaching sessions were used during this study. The format for each session was a 20 minute lecture on a Biomedical Science topic (which necessitates employment of calculations), followed by calculation type questions which students were asked to attempt within a thirty minute period. To ensure consistency, the same group of undergraduate second year students participated in all of the four sessions and all of the sessions were held in same standard rectangular classroom where the seats at the back were 8 metres (Image 1) from the front of the classroom.

During the first session students were free to choose their seat, whereas in the second session students who had previously chosen a seat at the front were assigned to a seat at the back and vice versa. The seating arrangement for sessions three and four was the same as that for sessions one and two respectively. All of the sessions ran well with students being willing to sit in assigned seats when required.

Several parameters were measured for each of the four sessions. Output was calculated as the number of questions attempted/not attempted and was measured using a scoring system where; a score of 3 was awarded for a question if a final answer was stated, a score of 2 was awarded if a question was attempted but no final answer was stated and a score of 1 was awarded if no attempt had been made to answer a question. Performance was measured as the number of questions attempted which had achieved the correct answer i.e. those answers which scored 3 for output (i.e. an answer was given) received a score of 2 for a correct answer and a score of 1 for an incorrect answer. A standard 22-item version of the Intrinsic Motivation Inventory questionnaire with a 7-point Likert scale was used with four subscales to enable assessment of participants: interest/enjoyment, perceived competence, perceived choice and pressure/tension while carrying out the calculation questions during each of the sessions (Intrinsic Motivation Inventory).

Linear multiple regression was used to observe how seat row affected output and performance and the student's t-test was used to compare mean values for each of the six measured parameters for both student groups.

Results

The mean values for each of the six parameters were calculated for all four sessions and are shown in Table 1. The highest scores for output (94%) and performance (79%) were achieved in session 3 where students were given a choice of seating, and conversely the lowest scores for output (70%) and performance (40%) were in session 4 when there was assigned seating.

For each of the four sessions, output was plotted against seat row (Figure 1). All four sessions demonstrated increased output by those students sitting towards the back of the classroom, irrespective of whether seats were chosen or assigned and this reached significance for session 2 ($p = 0.04$) and session 3 ($p = 0.008$). A similar trend, of better performance by those students sitting in seats at the back, was observed when performance was plotted against seat row (Figure 2) with significance being reached for session 2 ($p = 0.043$), session 3 ($p = 0.004$) and session 4 ($p = 0.044$).

As the results demonstrated that both output and performance were better in students who sit towards the back of the classroom and this was shown irrespective of choice or assigned seating, it implies that those students who choose to sit at the front perform better when moved to the back and vice versa. Further data analysis was therefore carried out to investigate the effects of changing seat position. Data was analysed by assigning student results into one of two groups (front or back) according to their choice of seat. Group A are those who chose to sit at the front of the class and Group B are those who chose to sit at the back of the class. For each of the two groups, results from choice seating sessions (1 and 3) were pooled; as were the results from assigned seating sessions (2 and 4) and the results are shown in Table 2. The results indicated that when those students who chose to sit at the front, were

asked to sit at the back, there was no statistically significant difference in their output, performance, interest, perceived competence, perceived choice or perceived pressure. Interestingly however, the results showed that when those students who chose to sit at the back, were asked to sit in seats at the front of the class, there was a statistically significant decrease in their output, performance and perceived competence and this was accompanied by an increase in their perceived pressure.

Discussion

Previous studies have indicated a relationship between seat position towards the front of the class being associated with better student performance (Levine et al. 1980) and the results of this study serve to confirm the association between seat position and both student output and performance. However, unlike most previous investigations which have indicated better performance by students in front row seats, the results from this study indicate that better performance is achieved by students in back row seats.

A possible explanation for this may be provided by a recognition that the number of students in this study is small ($n = 13$) and that the classroom is also relatively small as it has only four rows of seating. For the purposes of this study the first two seating rows were designated as being at the front of the classroom and the last two rows as being at the back of the classroom. Results have therefore been discussed on the basis of a 'front' (rows 1 and 2) versus 'back' (rows 3 and 4) seating designation. However, Griffiths (1921) identified that there may in fact be different performance zones at the front of a class. If this is the case, then it may be more appropriate for the results in this small classroom investigation to be re-designated as 'close to front' (rows 1 and 2) versus 'towards the front' (rows 3 and 4). This may then account for the

relationship between seating position and both performance and output demonstrated by Group B who, rather than sitting at the back of the class are actually sitting 'towards the front'. Regardless of Group B designation these results support a relationship between seat position and output/performance.

It has been suggested that student seating preference is in part due to differences in motivational factors; with students who choose to sit at the front being those who are well motivated for learning whereas those who sit towards the back tend to be more motivated by social interactions (Tagliacollo et al. 2010). Studies which have investigated possible influences of personality on seating preference have indicated that there are many personality traits which are significantly different in students who choose to sit at the front compared to those who choose to sit at the back (Totusek and Stanton-Spicer 1982), with those at the front tending to be more accepting, controlling, and intelligent (Pedersen 1994).

One of the goals of this study was to investigate possible effects of changing seating position, firstly on student output/performance and secondly on their perceptions of enjoyment, competence, choice and tension. The results showed that when those students who chose to sit at the front (Group A), were assigned to sit at the back, there was no difference in any of the six measured parameters. This is in accordance with the study by Perkins and Wieman (2005) where student performance did not differ when students were moved from the front to the back of the lecture hall halfway through a semester.

Interestingly, when those students who chose to sit in rows 3 and 4 (Group B), were moved to the front of the class, there was a statistically significant decrease in both

their output and performance which was accompanied by a corresponding decrease in their perceived competence with an increase in their perceived pressure. Regardless of the designation of Group B, (as either 'towards the front' or 'back'), the results clearly show that moving this group of students to a position where they are sitting right at the very front of the class had a detrimental effect on their output and performance and this was associated with changes in their perceived competence and tension. The results suggest that if these students feel under more pressure and actually perform worse when assigned to seats at the front, then this premise may also apply to other groups of students. It is suggested therefore that caution should be adopted if students are to be counselled about possible improvements in learning performance of repositioning themselves towards the front of the class (Kawlinowski and Taper 2007) as this may not be an advantageous option (Tagliacollo et al. 2010).

The results of this study imply a need for further work to enhance our understanding of how changing seat location impacts on performance and other learning associated factors.

Conclusion

It is concluded that changing seating position from choice to assigned seating can have an adverse effect on student output and performance which is associated with decreased perceived competence and increased tension. This has important implications for pedagogic practices of advising students of potential improvements in learning by moving to a front seat position.

References

- Adams, R.S. and Biddle, B.J., (1970) Realities of teaching: Explorations with the video tape. New York: Holt, Rinehart & Winston, pp110.
- Armstrong, N. and Chang, S. (2007) Location, Location, Location: Does seat location affect performance in large classes? *Journal of College Science Teaching* 37 (2), 54-58.
- Benedict, M.E. and Hoag, J. (2004) Seating Location in Large Lectures: Are Seating Preferences or Location Related to Course Performance? *Journal of Economic Education* 35, 215-231.
- Brooks, C.I. and Rebata, J.L. (1991) College classroom ecology: The relation of sex of student to classroom performance and seating preference. *Environmental Behaviour* 23(3), 305-313.
- Burda, J. M., and Brooks, C. I. (1996). College classroom seating position and changes in achievement motivation over a semester. *Psychological Reports*, 78, 331-336.
- Cinar, I. (2010) Classroom Geography: Who sit where in the traditional classrooms? *The Journal of International Social Research*. 3 (10), 2001-212
- Griffiths C.R. (1921) A comment upon the psychology of the audience. *Psychological Monographs: General and Applied* 30, 36-47
- Hopkins, K. (2011) The Colosseum: Emblem of Rome [Accessed 27th February 2012]. Available at:< http://www.bbc.co.uk/history/ancient/romans/colosseum_01.shtml>
- Intrinsic Motivation Inventory [Accessed 27th February 2012] Available at<<http://www.selfdeterminationtheory.org/questionnaires/10-questionnaires/50>>
- Kalinowski, S and Taper, M.L. (2007) The Effect of Seat Location on Exam Grades and Student Perceptions in an Introductory Biology Class. *Journal of College Science Teaching*. 1, 54-57.

- Levine, D.W., O'Neal, E.C., Garwood, S.G. and McDonald, P.J. (1980) Classroom ecology: The effects of seating position on grades and participation. *Pers. Soc. Psychol. Bull.* 6 (3), 409-412.
- Pavlika, V. (2007) An investigation into how classroom management affects student output. *MSOR Connections* 7, 38-42.
- Pedersen, D.M. (1994) Personality and classroom seating. *Perceptual and Motor Skills.* 33: 1355-1360.
- Perkins, K.K. and Wieman C.E. (2005) The Surprising Impact of Seat Location on Student Performance. *The Physics Teacher* 43, 30-33.
- Schwebel, A.L. and Cherlin, D.L. (1972) Physical and social distancing in teacher-pupil relationships. *J. Educ. Psychol.* 63, 543-550.
- Stires, L. (1980) Classroom seating location, student grades, and attitudes: Environment or self-selection. *Environ. Behav.* 12, 241-254.
- Tagliacollo, V.A., Volpato, G.L. and Pereira, A. (2010) Association of student position in classroom and school performance. *Educational Research.* 1, 198-201.
- Totusek, P and Staton-Spicer, A. (1982) Classroom seating preference as a function of student personality. *J. Exp. Educ.* 505, 159-163.
- Wulf, K.M. (1977) Relationship of assigned classroom seating area to achievement variables. *Educational Research Quartley.* 2(2), 56-62.

Table 1: Mean values for each of the four sessions

Session	Seating	Output	Performance	Interest/ Enjoyment	Perceived Competence	Perceived Choice	Perceived Pressure/ Tension
1	Choice	76%	52%	5.1	4.6	5.0	2.7
2	No Choice	83%	65%	5.4	5.1	5.0	2.5
3	Choice	94%	79%	5.3	5.3	5.1	2.2
4	No Choice	70%	40%	5.0	4.3	5.2	3.0

Table 2: Mean values for Group A and Group B

Sessions	Seating	Output	Performance	Interest/ Enjoyment	Perceived Competence	Perceived Choice	Pressure/ Tension
Group A							
1 & 3	Choice	76%	48%	5.7	4.6	4.7	3.1
2 & 4	No Choice	73%	48%	6.0	5.2	4.9	3.0
Statistical Significance		NS	NS	NS	NS	NS	NS
Group B							
1 & 3	Choice	89%	76%	5	5.2	5.3	1.9
2 & 4	No Choice	79%	56%	4.5	4.2	4.9	2.4
Statistical Significance		P<0.05	P<0.05	NS	P<0.05	NS	P<0.05

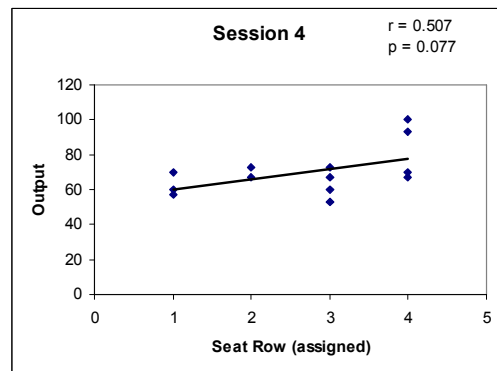
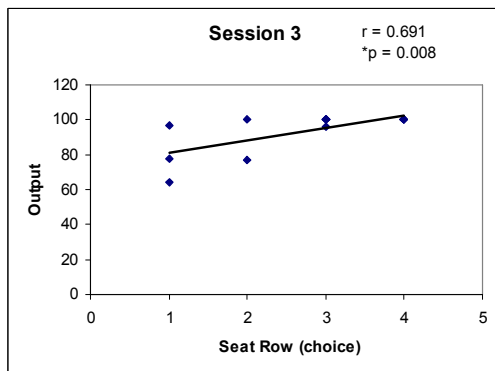
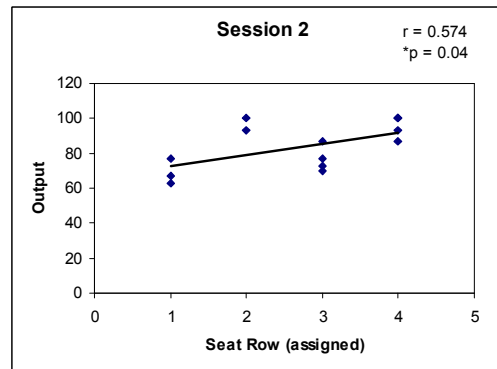
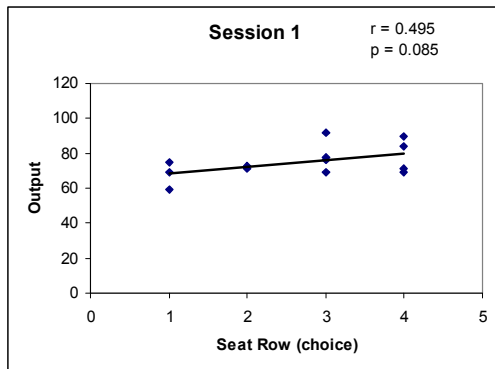


Figure 1.

The output of each student in the class plotted against the seat row that each student sat in, for each of the four sessions. The line shows the linear regression for the data where 'r' is the correlation coefficient and 'p' indicates the level of statistical significance.

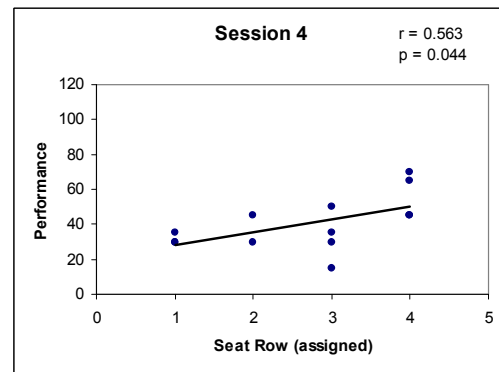
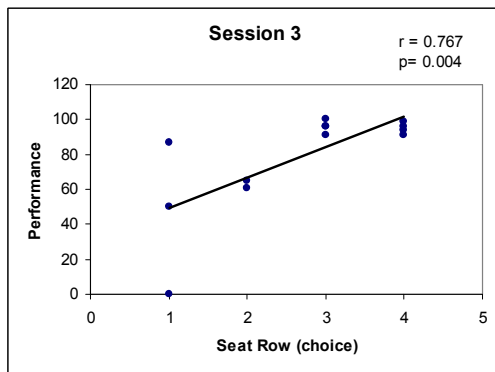
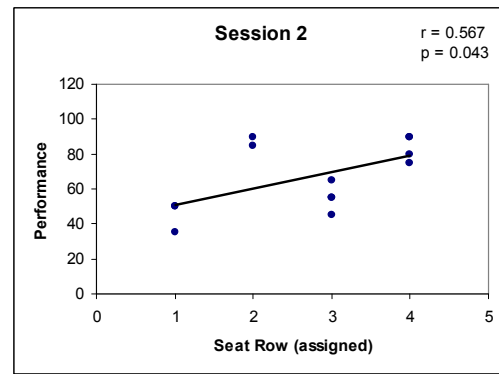
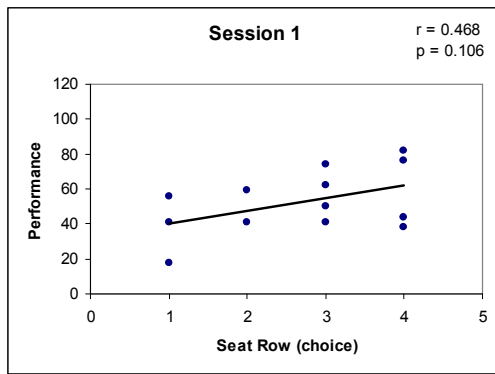


Figure 2.

The performance of each student in the class plotted against the seat row that each student sat in, for each of the four sessions. The line shows the linear regression for the data where 'r' is the correlation coefficient and 'p' indicates the level of statistical significance.



Image 1: Photo of Classroom