

Differentiation via WOLF: Providing steps to achievement

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Background and rationale

Recent efforts by UK governments to widen participation have contributed to student's entering higher education with wide range of different skills and experiences. It is common practice for some students to gain entry in Higher Education without having attained the traditional entry qualifications needed, particularly in subjects like sport, tourism and leisure where many students have not had the opportunity to study specific courses at A level or GNVQ. If students of mixed ability are expected to learn the same material, it is likely that some students will already understand what is being taught, while others will find it difficult (Davies, 2000). Consequently, it is important that work is differentiated so that students are provided with opportunities for progression, regardless of ability and experience (McGarvey, Marriott, Morgan & Abbott, 1997). Differentiation involves managing how content, learning activities, teaching methods and resources are varied to cope with the range of the student's experiences (Kerry & Kerry, 1997). The desirability of differentiation is widely recognised in the education process and is thought to be critical in making programmes of study relevant to the diverse needs of learners.

In the current climate of widening-participation, it is increasingly important to cater for student's different academic backgrounds and learning styles. An important consideration for adopting a differentiated approach in teaching is that it can help to minimise the risk of students developing a sense of failure (Davies, 2000). Where differentiation is successful, all students are given tasks that are suited to their academic ability. It is hoped that this increases the chance of attaining academic success. Differentiation of work is needed so that less able students can tackle tasks successfully. It is important that less able students do not experience excessive failure, as this may lead to a sense of failure and lowered self-efficacy (Bandura, 1997). The current practice in higher education is that differentiation is achieved by outcome. In other sectors of education, differentiation is generally achieved by grouping students by ability. Small groups of students and individual teaching methods enable students to engage in different learning activities at different levels. This enables their individual learning needs to be better taken into account when compared to whole class teaching (Norwich, 1994). It is possible within higher education to differentiate content for students through differentiated tutorials and seminars. This would enable students having had a common lecture experience to work on material that was suitable for their development.

A second approach to differentiating work is through structuring independent learning. Work can be differentiated in a number of different ways. One approach that has been largely ignored in the literature is to achieve this by using information technology supported learning frameworks such as WOLF. Recent research has argued that teachers should see frameworks such as WOLF as an additional space for learning, and as such, allow for the possibility of setting differentiated work (Haven, & Botterill, 2002). With reference to using WOLF among Sport Studies, Hall (2001) explained the relatively smooth passage in which students were encouraged to become frequent users of WOLF. It should be noted

that in September 2000 there were few modules in sport, leisure and tourism available on WOLF, and by September 2002, almost all modules in sport, leisure and tourism available on WOLF were available on WOLF. Hall (2001) reported evidence that students were using a great deal of the information placed on WOLF. It should be emphasised that Hall (2001) was referring to students reading lectures or article notes rather than engaging in interactive tasks. Applying suggestions of best practice for WOLF recommended by Haven and Botterill (2002), it is suggested that students should use WOLF interactively. Extending this logic, it becomes possible to develop differentiated material for use on WOLF. The aim of this project was to develop activities on WOLF that challenge and provide relevant feedback for students across the range of abilities. An anticipated outcome was improved student performance.

The innovation

The innovation involved writing differentiated tasks for use on WOLF. Suggestions that lecturers in Higher Education should differentiate work are relatively new. A great deal of research has examined the effectiveness of differentiated work by schoolteachers. In a review of practice in primary and secondary schools, Kerry and Kerry (1997) identified four methods of differentiation; 1) differentiation by outcome; 2) differentiation by rate of response; 3) differentiation by enrichment; and 4) differentiation by setting different tasks. Differentiation by outcome refers to the types of response expected from students. For example, teachers that recognise students' range of ability are likely to accept different levels of achievement and modes of presentation by students. Differentiation by rate of response recognised that students vary in the speed at which they grasp knowledge. Teachers can account for this in the pacing of their lessons, for example, by allowing students to work at different speeds, and in terms of the goals set for various students. Enrichment refers to the level of extra support materials provided to students. Enrichment might also include the development of associated skills, which are not directly related to the common task set for all students. Some other methods of differentiation include graduated worksheets and asking open-ended questions.

In the present study, differentiated tasks were written and placed on WOLF. Multiple-choice tests were used as the strategy to differentiate tasks. One test was easy and the other test was hard. Differentiation in difficulty was operationalised by the amount of time a student has to complete each test. It was also done by reducing the number of options (a choice from two rather than four) on the easy test. The WOLF framework has a facility for randomly selecting a number of items and it is possible to control the amount of time it takes to complete a test. It also randomizes the order in which questions are displayed. Therefore, it would be difficult for students to become familiar with the question set. Each test was based on a lecture. Students could read the lecture information and then take the tests. Once a student submits the test, her/his score is given immediately. It also is stored on the system and so can be looked at by the module administrator.

Differentiated tests were written for the following modules:

SR1012: Research methods in sport (approx 150 students on the module)

SR4003: MSc research methods in sport (25 students on the module)

GS4001: Postgraduate module for PhD students (30 students on the module)

SR4023: MSc Sport Psychology theories and research (8 students on the module)

SR3312: Current issues in sport (58 students on the module)

LR1004: Introduction to the management of leisure services (25 students on the module).

To encourage students to use the differentiated tests the approach taken was to put the lecture information and related tests on WOLF, informing the students in lectures of the new developments. Students in sport, leisure and tourism are common users of WOLF. It is typical for nearly 100% of students to register on WOLF, with most students using more than 50% of the available material. Most modules in sport, leisure and tourism are

available on WOLF and students expect information to be placed on WOLF. It was assumed that students would use the differentiated tests as part of their exploration of WOLF.

The outcomes

Data were analysed by looking at the number of students that accessed WOLF material, and scores on the easy and hard tests on WOLF. The aim was to investigate relationships between scores on the WOLF tests (easy and hard) with performance on the module. For the modules SR4003, GS4001, SR4023, SR3312, and LR1004, few students submitted their scores on the easy and hard tests and so it was not possible to conduct meaningful statistical analyses on these data. As Table 1 indicates, the relatively percentage of students that used all material was moderate but the percentage of students using the tests was low (the overall usage percentage score will be influenced by the low usage of differentiated tests).

Table 1. Usage of WOLF, percentage of students that took the differentiated tests

	Percentage WOLF usage of all material	Percentage of students that took difficult test	Percentage of students that took easy test
SR1012	52	22	26
SR4003	49	10	10
GS4001	48	12	6
SR4023	46	6	11
SR3312	25	63	9
LR1004	31	13	16

There were sufficient data collected from SR1012 as there were 126 students on the module. Pearsons correlation was used to assess relationships between lecture attendance, usage of WOLF, performance on the differentiated tests, and overall grade for the module. Descriptive statistics and correlation results are presented in Table 2.

Table 2. Descriptive statistics and Pearsons correlation for data from SR1012

	Mean	SD	1	2	3	4	5
1. Attendance	5.52	2.37	1				
2. Usage of WOLF	18.19	12.16	.45*	1			
3. Easy Test	17.42	29.94	.37*	.51*	1		
4. Hard Test	17.15	20.31	.36*	.38*	.65*	1	
5. Mark	6.53	3.53	.62*	.51*	.27*	.26*	1

* P < 0.01

Correlation results indicated that lecture attendance, usage of WOLF, performance on the differentiated tests, and overall grade for the module all significantly inter-correlated ($p < .01$). These results suggest that the greater attendance rate of students, the more they will access WOLF, and the better they will perform in the module, both on the differentiated tests and overall performance.

Table 2. Discriminant function analysis of differentiated test performance.

Mark Group	No. of cases	Predicted Pass		Predicted Fail	
		n	%	n	%
Pass	93	77	82.8	16	17.2
Fail	33	7	21.2	26	78.8
Correctly Classified: n = 103 (81.7%)					

A discriminant function analysis was performed using performance on the differentiated tests as a predictor of students passing or failing the module. The results are presented in Table 2. The results indicated that 81.7% of students could be correctly classified based on performance in the differentiated tests. Discriminant function relationships indicate that performance on the differentiated tests were a greater predictor of performance in the module than attendance or percentage usage of WOLF.

Benefits

There are several benefits of the innovation. First, considering the concept of differentiation and writing material on WOLF means the differentiated tests are available for students for the next few years for use by lecturers and students. Second, the project has highlighted how students use WOLF interactively. Students tend to use WOLF to obtain information rather than use information and engage in interactive tasks. This observation raises several possibilities as to how lecturers can encourage students to use WOLF. It could be that students need to be taught how to use interactive aspects of WOLF. The principles outlined by Hall (2001) whereby students need to be shown the benefits should be adhered to and an acknowledged limitation of the strategy in the present study is that this could have been addressed from the outset. Batey (2001) outlined that there is not a culture of usage of information technology among sport students. Findings of the present study indicate that students are good at downloading information from WOLF, but engage in tasks in which feedback is available with caution. Third, the innovation encourages staff within Sport, Leisure and Tourism to consider how WOLF is used. There is an assumption that placing lecture material on WOLF could lead to poor attendance. Findings from the present study indicated that WOLF usage and lecture attendance contribute independently to performance. The take home message is that better marks are linked with attending lectures **and** using WOLF. It is not intended that WOLF replaces contact with students, but it can make a different learning space. Lecturers who upload information on WOLF report that they no longer use lectures to deliver information as it is assumed that students can access the information via WOLF. It is argued that lectures are used to synthesise information and use information rather than simply deliver it.

Evaluation

Relatively low usage of differentiated tests represented a disappointment for the research group. Findings from the module in which statistical analysis pointed to worthwhile results indicates that pursuing greater usage of differentiated tests could be worthwhile. Students or lecturers have not always readily taken up the development and implementation of WOLF based material in the curriculum. It is argued that a movement toward interactive learning represents an important development within this process.

Future developments

The development of WOLF based material for this project allows for research that is more extensive. There are plans to investigate student's perceptions of WOLF through the use of qualitative techniques. A second project investigates the influence of feedback via WOLF on self-efficacy to achieve learning outcomes for specific modules.

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