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Articles

From the Editors – About this Issue

By Karen Bjerg Petersen and Peggy J. Saunders, Editors of JISTE

We are pleased to present the current issue of the *Journal of the International Society for Teacher Education, JISTE*, Volume 22, number 2, featuring the theme "Education: Factors Influencing Learning, Teacher Perceptions, and Student Achievement". Current and former members of ISfTE – the International Society for Teacher Education – have contributed articles for this issue. The articles witness the multilayered interests of educators from various parts of the world towards numerous aspects of the teacher profession. The first two articles in this issue written by Norwegian teacher educators reflected upon the influence of environment either physical or virtual on teacher education. Teacher perceptions was the topic of the next two articles. While the American authors focused on how pre-service educators' perceptions change through service learning, the European/Bhutanese authors investigated teacher perceptions of feedback in certain specific contexts of foreign language teaching. The final article is from researchers in Nigeria. Its focus is about how academic achievement can be improved through after school programs. In sum, the five articles may open a new world for readers and educators who are interested in understanding the role of teacher education, teacher educators, and teachers in diverse contexts and different countries of the world.

We would like to thank the reviewers who have contributed with several and repeated reviews on the submitted articles for this issue. We are grateful for the active support from scholars from all over the world, members and non-members of ISfTE, who have spent their time and used their expertise to review the manuscripts.

ENVIRONMENTAL INFLUENCE ON LEARNING: REFLECTIONS ON AN EXPERIENCE FROM FURTHER EDUCATION IN PEDAGOGIC ENTREPRENEURSHIP

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Abstract: *Lecturers in higher education in Norway are encouraged to take a researcher's attitude to their own teaching methods to determine what works best. This study looked at what environmental factors are successful criteria for further education courses. The research was based on information from three pedagogic entrepreneurship courses for Norwegian teachers run by the University of Agder in Lesvos, Greece. Questionnaires were sent to all participants. Four additional questions were published in the respective Facebook groups. The participants' evaluation made after each course and the use of their Facebook groups were also studied. The participants emphasized that environment, sharing of experiences, ample and dedicated time to work with the subject, engaged lecturers, and creative tasks were positive factors. The results indicate that the participants had received inspiration, knowledge, and tools to continue using entrepreneurship in their schools. They have created networks that have been very useful.*

Key words: further education, pedagogic entrepreneurship, location, environment, course organization.

Introduction

According to a white paper from the Ministry of Education and Research in Norway (2017), *Quality Culture in Higher Education*, the key to high quality education is one that activates and engages the students as equal members of the academic community. The Norwegian government expects that the academic environment, to a much larger extent, uses teaching methods where the students play an active role. The paper further stated that the quality in higher education does not come about through resolutions passed by the Norwegian parliament or by the government. Higher education institutions must take the largest share of the responsibility. In the white paper, lecturers in higher education were also encouraged to have a researcher's attitude to their own teaching methods to determine what works best. In this article, we will describe three courses in pedagogical entrepreneurship for teachers and the research done on the environmental factors influencing learning.

The official Norwegian report, *The School of the Future—Renewing Subjects and Competences*, highlighted four areas of skills which will be important in the school for the future: subject-specific skills, competence to learn, communication and interaction skills, and participation in exploring and creating (Ministry of Education & Research, 2015). The plan of action paper *Entrepreneurship in Education – From Primary School to Higher Education 2009-2014* (Ministry of Education & Research, 2009) submitted different measures to strengthen efforts in entrepreneurship in education. Universities and university colleges should have, by 2012, shown the learning outcomes with respect to innovation and creativity. The ministry made funds available for further education in entrepreneurship for teachers, and the University of Agder was granted funds for three successive years (2012-2014).

The course, *Entrepreneurship in Schools*, was developed and implemented by the

university (University of Agder, 2012). Entrepreneurship is defined in the Norwegian Strategic Plan as being "a dynamic and social process where individuals, alone or in collaboration, identify opportunities for innovation and act upon these by transforming ideas into practical and targeted activities, whether in social, cultural or economic context" (Ministry of Education & Research, Ministry of Trade & Industry, & Ministry of Local Government & Regional Development, 2006, p. 4). Entrepreneurship can be used as a tool and method to stimulate learning in different ways (Ministry of Education & Research, 2009). The course, offered three consecutive years, gathered teachers from the whole country in a secluded place (Lesvos, Greece) for seven days, followed by a one-day gathering on campus in Norway. The participants did not have to pay course fees, but they had to pay for travel, food, and accommodation. The courses were run at a small and quite simple hotel with lots of Greek hospitality. During the course, the participants lived, ate, attended lectures, worked in groups, and discussed entrepreneurship even when swimming and walking together. They spent the whole week together away from their everyday life. The total cost was approximately the same as a comparative course would cost in Norway.

The main content of the course was how to use entrepreneurship as a learning strategy according to the *Knowledge Promotion Reform* (Ministry of Education & Research, 2006). The course also comprised the teacher's role in enterprises in schools, models for integrating entrepreneurship, production of action plans for entrepreneurship in the schools, and cooperation with business and industry. Teaching methods were group activities with presentations, entrepreneurship exercises, lectures, and excursions. The students wrote a home exam and received guidance over the Internet. The learning outcomes of the course were that the students would know what the terms entrepreneurship and innovation mean and imply, produce an action plan for the introduction of entrepreneurship in their school, and be able to use entrepreneurship as a method in education and learning (University of Agder, 2012).

A common feature for these courses was that they received very good evaluations from the participants, and the groups created functioning networks. After having looked at the evaluations, one question presented itself: have the location, surroundings, and duration of the course any influence on the success of the course? In our research, we have examined what environmental factors could be success criteria for further education courses. What happens when people are moved away from their normal workplace for one week and "dropped" in a totally different environment? What happen to the learning outcomes, sharing of experiences, and networking under these conditions?

Theory

Bandura's theories about reciprocal determinism, observational learning, and self-efficacy can illuminate some of the mechanisms that take place when people live and study together for a week in a different environment (Kelder, Hoelscher, & Perry, 2015). Reciprocal determinism consists of three elements: personal cognitive factors, behavior, and environment, and they interact with each other (Bandura, 1978, 2009). The change of environment was one of the factors we looked at in this study. There was additionally an aspect of modeling and observational learning in these courses (Bandura, 1971; Kelder et al., 2015). Bandura (2009) stated, "Modeling affects the adoption of new social practices and behavior patterns in several ways. It instructs people about new ways of thinking and behaving by informative demonstration or description"

(p. 285). Observational learning occurs when a person learns new behavior and information by observing others´ behavior and the consequences of this behavior (Kelder et al., 2015). Streule and Craig (2016) described that students developed a clear professional identity during a week's field work in geoscience. The students developed the professional language and adequate working methods by working with teachers and fellow students over a longer period. They found that field trips are a powerful tool for effective learning.

According to Bandura (1995), despite other factors, the importance of how much people believe that they can accomplish a task, self-efficacy is the most important issue to change behavior. Because people operate individually and together with others, self-efficacy can be an individual and a social construct. Bandura has examined several studies by other researchers. He observed in their findings that the higher the perceived collective efficacy, the higher the groups' motivational investment in their undertakings, the stronger their staying power in the face of impediments and setbacks, and the greater their performance accomplishments (Bandura, 2000). Even in 2000, Bandura mentioned the revolutionary advances in electronic technologies creating new social opportunities.

Nissley (2011) examined what influence location has on learning. He ascertained that place matters, and his article discussed several aspects of how place affects learning: learning *about* a place, *in* a place, *from* a place, and *for* a place. Grill (2003) stated that if educators and administrators understood the benefits of certain natural settings, they could and would use them to promote educational programs. Bersch and Lund (2002) found that the environment can act as a catalyst for learning and help create an exciting and productive learning experience. Education studies have shown that time is often a limiting factor for school development (Hargreaves, 1994).

As Hargreaves (1994) said,

> Scarcity of time makes it difficult to plan more thoroughly, to commit oneself to the effort of innovation, to get together with colleagues, or to sit back and reflect on one's purpose and progress. How much time teachers get away from classroom duties, to work with colleagues or just to reflect on their own, is a vital issue for matters of change, improvement and professional development. (p. 15)

Another review focusing on writing retreats presented five key benefits of being *in* a place: (a) protected time and space, (b) community of practice, (c) development of academic writing, (d) intrapersonal benefits, and (e) organizational investment (Kornhaber, Cross, Betihavas, & Bridgman, 2016).

Good ideas often emerge round a coffee table or more relaxed settings than offices and classrooms. Brown, Isaacs and the World Café Community (2005) developed the concept World Café where people meet informally to discuss a theme. A World Café session is set up as a café area, and the participants change discussion partners during the session.

Method

The research was based on information from three courses held in Lesvos, Greece, for Norwegian teachers (2012, 2013, and 2014). Data were collected from three different sources: mandatory evaluations and final reports, a closed-form survey, and the participants' Facebook groups. The evaluations gave us some very interesting answers which led to development of a closed-form survey. The participants commented on the place and time and the possibility to create networks. To get an even better understanding of these answers, we posted some questions in the Facebook groups and looked at activity in the groups. According to Creswell and Clark (2011), this research is an example of mixed

methods where one set of data is used to further explain another set of data. The closed form survey and Facebook activities helped to further explain the evaluation and final reports.

Participants

Applications were received from about 50 teachers for each course. In the application, each teacher had to explain why he/she should be chosen to participate in the course. From these, about 20 teachers were handpicked according to certain criteria to make a nonhomogeneous group. The criteria were as follows: teachers from different parts of the country, from different levels in schools, different sex, motivation, and if possible, two from each school. Some had a lot of experience and engagement in pedagogic entrepreneurship, others had just started, and some needed a boost to continue.

Evaluations and Final Reports

The courses were funded by the Directorate for Education and Training, and final reports were filed to the Directorate. The final reports included both students' and lecturers' reflections on the course. It was mandatory to conduct mid-term or final evaluation of all topics at the university. On the last day in Lesvos, the students were asked to answer anonymously in writing four open-ended questions:

1. What did you especially like about the course?
2. What can be done to improve the course?
3. How many points on a scale from 1 to 10 (10 is best) would you give for (a) learning outcomes and (b) the course in total? and
4. Other comments?

Asking the students to evaluate the course on the last day in Lesvos, we ensured 100% response rate. The students were not given the possibility to discuss their answers. We summarized the answers from all evaluations to get the main opinion of the students.

Closed-form survey. In the autumn 2015, questionnaires were sent to all participants of the courses, about 70 persons, a majority of whom were women. In the introduction to the questionnaire, it was stated that the results of the survey would be used for research. We received answers from 36 persons (51. 4%)—11 men and 25 women. The participants' mean age was 49.2 years, and the std. deviation was 10.3. The questionnaire included background questions about age, sex, work, year of attending the course, and how many years they had used entrepreneurial methods in their work. The questionnaire also included some open-ended questions about the location, the quality of the course, and the participants' learning outcomes. The participants were asked how useful they found the course. The participants were asked how useful they found the one-week course in Lesvos. They were also asked about other ways the course could have been arranged to achieve the best learning outcomes: one week on campus, two three-day gatherings on campus, one three-day gathering on campus combined with internet lectures, weekly internet lectures, and traditional lectures on campus. For these questions, the respondents could mark to what level they agree or disagree with the given statements (Befring, 2007). A 7-point Likert scale was used, where 1 is strongly disagree, and 7 is strongly agree. The results were made anonymous.

Facebook groups. In every course, the participants have taken the initiative to establish a closed Facebook group and invited the lecturers to be members of the group. We have looked at how the members have used their respective Facebook group during and after the course. To gain a

deeper understanding of the reasons for the success of the courses in entrepreneurship, we posted questions in the different Facebook groups. Answers could be sent as a personal message or an e-mail. The questions were about the location, the length of the course, the lectures, workshops, innovation camps, creating networks, and the effect of the course on colleagues. This data collection was carried out in March 2017, and we got four answers, one on Facebook and three on e-mail. We have compared and extracted the essence of the answers.

Result and Discussion

From the different sets of data, we see that the answers often coincide. Therefore, we have chosen to present and discuss our results under two themes: external conditions and internal conditions. The external conditions include location, surroundings, and duration of the course. The internal conditions include lectures, workshops, innovation camp, and networking. Finally, we will mention some strengths and limitations of our study.

External Conditions

The participants were asked to range how they thought the learning outcomes would be with different organizational forms of the course (Table 1). The data from the questionnaires showed that most of the students thought the learning outcomes would be best with one week in Lesvos, with a median of 7 (74 % marked this alternative). At the other end of the scale, online lectures only, were the least preferred organization form with a median of 2.

Table 1
Organization Forms and Learning Outcomes

	One week in Lesvos	One week on campus	2 gatherings of 3 days on campus	One gathering (3 days) and online lectures	Online lectures only	Traditional weekly lectures
Median	7	4	4	3	2	3

Note. Median is based on a 7 pt. Likert scale.

The respondents emphasized that sharing of experiences, ample and dedicated time to work with the subject, engaged lecturers, and creative tasks were positive sides of the course. In the evaluation, several of the participants wrote that it was a very suitable location for a course. Nobody went home after dinner, they talked about entrepreneurship at every meal and even when swimming. The hotel, with the staff included, was a perfect place to run the course. It made the participants relax and be open for learning. Several participants commented on the location, and although the program was busy, they got energy from the beautiful surroundings. The environment worked as a catalyst for learning (Bersch & Lund, 2002)

In the answers on Facebook to the question about the place, the participants say that the hotel was perfect. Everybody was gathered under one roof for one week 24 hours a day away from everyday worries. We do not know what the main reason for applying to the course was – Greece or entrepreneurship. As Nissley (2011) said, we were learning *in* a place; however, very soon, entrepreneurship became the main reason. In one open question in the survey most participants highlighted the content of the course, networking, and sharing experiences. They commented that the location was a bonus. Cold Norwegians really appreciate the sun and warm weather. One of them said, “It makes us more positive.” This way of organizing a course is in line with the findings by Kornhaber et

al. (2016) on protected time and space. As one of the participants expressed,

> For me this course has been of immense importance. I sat in Lesvos and thought: What a wonderful place to build networks and to have so many clever people around me who will share their experiences, help me and my school to improve. Here we have a group of motivated, eager to learn, creative, exciting and clever people gathered in one hotel for a whole week, to make one another better.

The participants expressed that one week was an optimal duration for the course and for being away from school and family. One of them said, "The course could not be one day shorter; every day was essential for everything to be digested and absorbed." Another participant expressed, "I learned more in one week than I think I would have learned in one year with lectures."

The environment made the participants talk to new people; they listened to new theory; and they took part in actions they normally would not do. All these items had an impact on how they think and react personally. The participants did not know one another, but the environment was conductive to making new friends, and forming new partnerships and support networks (Sgroi & Saltiel, 1998). The participants experienced a community of practice: sharing vision, collegial support, mentorship, and social interaction (Kornhaber et al., 2016).

When the participants returned to their home environment, the environment was the same, but their behavior and personal cognitive factors changed, and these factors have the potential to influence the home environment (Bandura, 1978). After returning home one of the participants expressed, "The teaching became more varied, active, and creative. The pupils enjoyed this. They also experienced more pupil participation…. The school I worked at was positive. Many colleagues showed great interest and wanted me to share my knowledge."

One important thing we do in the courses in entrepreneurship is to change the environment. Twenty-five different teachers and lecturers were "dropped" for a week in an unknown location. From the answers, we can see that both the location and duration was important for the participants' learning outcomes. In a shorter course the location would not have had the same impact. Nissley (2011) assumed that *place matters*. The answers we got confirm that for these courses: place matters.

Internal Conditions

The participants were satisfied with the contents of the course: with theory and play in an exciting mix. In the evaluations the participants gave each course a mean score of more than 9 out of 10, for both learning outcomes and the course in total. The course started with an innovation camp to make the participants get to know one another; they got the same experience as their own students do when they participate in an innovation camp. Activities and concepts were not just talked about, the participants had to be active. In the evaluation of the courses, the participants expressed satisfaction with having experienced an innovation camp. They built up confidence to guide their own students through a similar experience. Kornhaber et al. (2016) mentioned confidence and motivation as part of the intrapersonal benefits.

The participants saw models that were interesting for them because the models, the other teachers, and the lecturers, had accomplished tasks in the field they were interested in (Bandura, 1971; Kelder et al., 2015). According to Heaney and Viswanath (2015), models that have the strongest

impact are those that have similar characteristics to themselves. During the week at Lesvos the participants also got to know the models personally, and their identity as entrepreneurship teachers was consolidated in the same way as Streule and Craig (2016) experienced identity development during field trips.

As a part of the course, the participants got time to develop an action plan for entrepreneurship for their own school. This activity was thought to be very valuable and useful. At work, there is limited time for creative thinking. Every day has enough challenges. These limitations coincided with the findings of Bersch and Lund (2002) and Hargreaves (1994). The participants were satisfied that they could try out their action plan and write about their results as the exam answer. In this way, they felt that they did something useful instead of just having their knowledge tested.

The participants also mentioned interesting and complementing lectures. They got inspiration, knowledge, and tools to continue using entrepreneurship in their schools, and the course gave them new perspectives of teaching and entrepreneurship.

The survey was distributed 1-3 years after completion of the course. One of the questions asked the participants to decide on the statement: "Today I have a great advantage of having completed the course in entrepreneurship". The 7-point Likert scale, ranged from "a small degree" to a "large extent", was used. The median was seven, which means that the participants continue to experience good benefits of the course even after some years.

Using the networks they have created, they have been able to share experiences and support and help each other. This finding indicates that building relations through meeting and living closely over time, makes the threshold for using the network after the course lower.

A result of the course has been that several of the participants' students have won prices in pedagogical entrepreneurship in county competitions, in the Norwegian competitions, and European championships. These awards were posted in the Facebook groups. Some of the participants had never won anything before attending the course. The participants shared plans, encouraged, supported, and congratulated each other on Facebook. The conditions made it possible for the students' self-efficacy and the collective efficacy to improve during the week (Bandura, 2002). It seems that the Facebook groups work as an extension of the week to enhance the collective efficacy. The participants continue to encourage each other and share new accomplishments. As mentioned earlier, Bandura (2000) talked in year 2000 about new technical social opportunities that would expand the interaction despite physical borders.

Strengths and Limitations

All the participants answered the evaluation on the last day of the week in Lesvos. In addition, we also collected data in different ways and at different times. This diverse data collection may be a potential strength of the study as the participants have had a chance to reflect on the course. The course has been run three times in the same location, with the same lecturers, but with different participants. However, the feedback was positive for all three courses.

The study also has some limitations. This course has not been run in another location, so we have no comparison. The participants attended the course in different years, and consequently, the time from attending the course to answering the survey varied. This different time spacing may have influenced the answers.

The authors of this article were teachers at the courses. We got to know the

participants, and we noticed what happened during the week. Therefore, we may not be objective observers. This connection can be both a strength and a weakness.

Conclusion and Further Research

We believe that environmental factors can have a positive influence in any subject anywhere, not only in entrepreneurship. Our research has shown that the location is an important factor; however, the organization of the courses and being together for a whole week are additional key factors. The participants have developed further as teachers and use pedagogical entrepreneurship as a teaching strategy after the course. They have been sharing their knowledge with one another and with colleagues.

This study indicates that the participants in the courses in entrepreneurship in Lesvos received the inspiration, knowledge, and tools to continue using entrepreneurship in their schools. They emphasized that sharing of experiences, ample and dedicated time to work with the subject, engaged lecturers, creative tasks, and the location were positive parts of the course. It is difficult to say which factor was the most important for success because we have not run a course with exactly the same content on campus or elsewhere. There is a need for further research on the environmental factors and how to organize further education courses for best learning outcomes. One participant summed up the experience of the course in this way:

> You have created more than 20 entrepreneurship teachers, who, full of enthusiasm and engagement, will take this back to 15 schools to spread the happy message. It creates rings in the water. The place is fantastic; the beautiful warm surroundings draw forth the best in us, and happy people learn more. The learning environment was fantastic. The pressure to learn has been heavy, and even when there is no lectures or assignments to do, everybody has constantly been sharing good and less good experiences.

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DOES THE INTRODUCTION OF LEARNING MANAGEMENT SYSTEMS IN VOCATIONAL EDUCATION AND TRAINING AFFECT LEARNING? A NORWEGIAN EXPERIENCE

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Abstract: *Recently, learning management systems have been introduced in the Norwegian school system, including vocational schools. Some vocational teachers have been sceptical about using learning management systems in vocational education and training. This study examined if the vocational teachers' use of a learning management system facilitated the students' opportunities to prepare for the tasks that will be part of their future as an apprentice. The research question was How does the introduction of learning management systems in vocational education and training affect learning? In vocational education and training, the transfer of tacit knowledge from master to apprentice has traditionally played an important role in the teaching. This transference of knowledge takes place in a face-to-face setting and in an interaction between master and apprentice which is based on acting, showing, explaining, and commenting. Documentation requirements through learning management systems appear to strengthen the vocational students' understanding of work tasks they will encounter as apprentices in the workplace. Learning management systems allows for the transference of tacit knowledge, and the documentation also appear to strengthen the communication between students and teacher.*

Keywords: tacit knowledge, vocational education and training (VET), learning management systems, OLKWEB (apprentice training documentation tool)

Introduction

The main approach to Norwegian vocational education and training is the 2 + 2-model. In the first half of the model the students in vocational programmes attend high school for two years, then in the second half, they have a two-year workplace apprenticeship. The training is regulated by the Norwegian Education Act and follows national subject curricula that apply to both the education that is taken at school and the training in the apprenticeship company. Most vocational subjects follow this model (Norwegian Directorate for Education and Training, 2016).

The result of the latest reforms in Norway, *Reform 94* and the *Knowledge Promotion Reform* (Norwegian Ministry of Education and Research, 2006), has been that a larger part of vocational education and training (VET) has been detached from the context where the competence will later be used. Where earlier courses were tailormade for specific subjects and professions, today's courses have broad programme areas and subjects that do not correspond to specific vocations and trade areas in the workplace. When students today start the first year in upper secondary education (Vg1), the education and training is outlined by the education programme, not by the individual subject or trade. The second year (Vg2) also has programme subjects that are common to several subjects and trades (Nyen & Tønder, 2014). To remedy this situation, a special school subject was introduced in 2011, now called vocational specialisation (YFF), where the aim is to give students the opportunity to gain experience of content, tasks, and methods that characterise the various vocations within the education programmes and to acquire relevant knowledge for general education subjects (Norwegian Directorate for Education and Training, 2016). In vocational education and training, the transfer of tacit knowledge from master to student and apprentice has traditionally played an important role in the teaching. This transference of knowledge takes place in a face-to-face setting and in an interaction between master and apprentice which is based on acting, showing, explaining, asking, and commenting.

Tacit Knowledge

Knowledge can be divided into two main categories: explicit and tacit knowledge. Explicit knowledge can be formulated relatively easily using words, numbers, and symbols and can thus be reliably transferred to others. Tacit knowledge, on the other hand, is

more difficult to articulate and communicate. The distinction between explicit and tacit knowledge largely depends on knowing and being able to do a particular action (Johannessen & Olsen, 2008). Tacit knowledge is a concept formulated by Polanyi (1966). His two key points were that tacit knowledge can often, but not always, be explicitly formulated in an assertive form, and that explicit knowledge must rest upon and presuppose tacit knowledge (Collins, 2010; Grimen, 1991; Polanyi, 2000; Rafoss & Witsø, 2014).

Polanyi's (2000) point of departure for the concept of tacit knowledge is that the individual knows more than he or she can communicate verbally to others. The development of professional awareness and discernment is only possible by acting; that is, performing tasks and reflecting on what is being done before it is being done, while it is being done, and after it has been done. In high school, knowledge is usually transferred in a situation where teachers and students are in a face-to-face setting and where the teachers both demonstrate and explain. Vocational subjects are about transferring skills that are associated with work operations. The student will then try to succeed at working with the skill while the teacher is present and can guide along the way through demonstrating and explaining. The student practises the skills until they are mastered so that the teacher can record that they have been acquired.

Apprenticeship Training Agencies

When the Norwegian model was created in the 1990s establishing an apprenticeship training agency (Opplæringskontor), it was a means of making the apprenticeships more relevant by strengthening the cooperation between companies and between schools and companies (Nyen & Tønder, 2014). Many apprenticeship training agencies have helped to facilitate training in the YFF subject in the participating companies. The apprenticeship training agencies have also facilitated training by offering electronic follow-up tools where goals in the curriculum are linked to work tasks in the company that will be documented as having been carried out and understood (Michaelsen & Høst, 2015). One of these follow-up tools is OLKWEB (Apprenticeship Training Agencies' Web Based Documentation Tool), which is primarily described as an online follow-up platform for vocational students, apprentices, upper secondary schools, training companies, and apprenticeship training agencies (http://www1.olkweb.no). This tool has been used in vocational upper secondary schools in the YFF subject.

Purpose

In this study, I examine if the vocational teacher using OLKWEB facilitates the students' opportunities to prepare for the tasks that will be part of their future as an apprentice. This study will be of interest and have relevance because the use of such a learning management system as OLKWEB is a new phenomenon in this branch of the Norwegian high school system, and there has been almost no research into this topic in the vocational education and training field until now.

My research sought to answer this overall question: How does the introduction of learning management systems in vocational education and training affect learning? Two further questions helped to guide the research:

1. Does the vocational teachers' use of OLKWEB enhance the communication between teacher and student and enhance the students' reflections and mastery of vocational knowledge compared to traditional paper-based communication?
2. Does the use of the learning management system in vocational education and training help to raise awareness of the tacit knowledge that forms an important part of the transfer of knowledge from vocational teacher to vocational student?

In YFF, the teacher is at a high school and the student is working in a company. They are not in a face-to-face setting. In such a situation, is it possible for the teacher to then convey tacit knowledge? Can the teacher assess whether the student has acquired a certain type of verbal knowledge? OLKWEB is designed to instruct the students and evaluate whether they have acquired particular knowledge of their own. Is this possible using OLKWEB?

Methodology

I collected data by observing and interviewing teachers and students in their use of OLKWEB in their normal school activities. The data are based on interviews with and observations of teachers and students at two vocational high schools (School 1 and School 2) situated in two cities in two different counties in southern Norway. This collection has resulted in three sets of data:

1. At School 1, I conducted a qualitative interview with two vocational teachers in two trades: building and construction and automotive vocational area. This interview was recorded and then transcribed.
2. At School 1, I also observed and interviewed students and a teacher in a carpentry class that showed me how they documented work that they had performed in YFF in OLKWEB. This interview and the interaction between the teacher and students were recorded and then transcribed.
3. At School 2, I observed and interviewed a teacher and students when they used OLKWEB as part of their ordinary teaching activities. I documented this activity by obtaining screen dumps of what they were doing and noting what they were saying.

The extracts from the interviews with the students and teachers have been rendered anonymous so none of the interviewees can be identified. These were unstructured group interviews where my interest was in discovering the meaning of the topics that arose in the interview conversations (Johannessen, Tufte, & Kristoffersen, 2004). The meanings of the text were analysed by condensing meaning. The focus of this approach is on exploring and describing people and their experience and understanding of a phenomenon (Creswell, 2009; Johannessen et al., 2004).

The first stage in the analysis of the interview material was to form an overall impression and provide a summary of the meaning (Johannessen et al., 2004). I identified the main themes in the interview and observation material. The first analysis focused on identifying the themes, statements, patterns, and relationships that appeared in the text. Coding resulted in five categories, arranged according to course initiation: (a) assignment and description of the task(s), (b) performance of the task(s), (c) documentation of the executed task(s), (d) teacher feedback and evaluation, and (e) plenary review in the classrooms. With the further analysis of the data material, I extracted the most essential descriptive statements under each category to shed light on the facts. I will address, in each category, the descriptive statements by linking them to the three aspects of tacit knowledge: action, reflection, and interaction (Johannessen & Olsen, 2008).

Findings

Assignment and Description of Tasks

Students in the various programs are connected to OLKWEB through their own laptop. In the automotive vocational area, the teachers have made their own subject curricula for practical work in Auto Repair Level 2. This means that the objectives from the national curriculum are specified and presented as tasks that the students will then plan, execute, and document. The teachers say that they are very satisfied with the online tool:

> It's very nice. They're not particularly fond of OLKWEB, let's be clear on that. They need some help, and they need to have some time for it. They have to be encouraged. and have to be pushed a little. But the planning development time, it's easier now than before when we did it on paper, so that we're quite happy with it.

In the YFF, the students use learning objectives from Level 3 and work through the curriculum directly in OLKWEB. They must check OLKWEB to see if anything is missing. The teacher explains that in this way, the students are involved in planning their own learning. Time is set aside in the classroom to create individual specific curricula, which the students take with them to the firm where they will ask for help in satisfying the learning objectives they themselves have set up with the support and guidance of the teacher.

In the program for building and construction, the tasks were described in two ways. When it comes to work assignments given to the students while they are in school, the teacher is

involved and may influence the work processes. Here he uses OLKWEB as a tool to specify objectives and competence on the project level. Each construction project, for example the construction of a new house or renovation of a cultural heritage site, requires completely different approaches. In OLKWEB, the teacher must describe the tasks the students are to perform in their training. He cannot demonstrate this, he must formulate it linguistically. That is, he must turn some tacit knowledge into explicit knowledge. The student must then interpret what he or she reads in OLKWEB and translate this into action.

When the students have on-the-job training in a company, they, not the teacher, must instantiate the learning objectives for the work tasks because they are out in the firms working on tasks that are so different from each other that it is not possible for the teacher to have an overview of all of them. The student must therefore make the same type of reflection on the relationship between explicit and tacit knowledge as the teacher does when describing the work tasks. In the program for technical and industrial production, where most of the students chose the industrial mechanic subject as their YFF apprenticeship, the teacher was positive about the students' opportunities to find curriculum goals related to the tasks they performed in the company.

The building and construction teacher was focused on facilitating the students' professional development by planning how he could describe tasks that were again linked to the competence objectives in the relevant subject. That is what he describes as "specification at the project level". His students had the YFF subject at Level 1, and he thought they were too young to see the significance of building a wall or ceiling. He felt that they needed to be given an illustration of the entire construction process through a project description or an outline describing it from beginning to end. It is interesting that this teacher thinks that students at Level 1 are unable to transfer the knowledge from the curriculum to work tasks as the students at Levels 2 and 3 are able to do. I find that this response is due to the difference in practical craftsmanship (and thereby tacit knowledge of the craft), reflecting the different levels they are on in their vocational education.

Task Performance

The students have practical work either at Level 1 in the YFF subject, or they have it in a company as part of their on-the-job training at Level 2. The teacher is responsible for the students and is the one who grades the subject. Practical work is a very important arena for the students' development in the trade or vocation. Some of the students are alone with a professional or another person who is responsible for following up and giving assignments to them in the apprenticeship company. The following quote from the building and construction teacher points out the importance of OLKWEB's role in transferring vocational and tacit knowledge:

> This is where I think that in the development of our subject we do not basically have a fixed template for things. I see that the students are having difficulty zooming in on the vocational aspect. In our industry, in practice, we go out, it's like having to take each job project by project, and it basically requires good knowledge of how things appear to be. I look at OLKWEB as a tool for specification at the project level. So, I need to have, after all is said and done, a lot of learning plans. A curriculum for each project.

The building and construction teacher stated he has good opportunities to transfer knowledge about the trade in projects where he himself helped and worked together with the students. He referred, for example, to the project where the school had been commissioned to restore a historical building. Here he could be hands-on in planning, execution, and a plenary review. At the site he could both demonstrate and explain to the students how to perform their craft and thereby transfer tacit knowledge to them. However, only a few students could be involved in this practical work on this specific construction project. The other students were on other construction sites and were given their work tasks by the apprenticeship company. The teacher was unable to predict what kind of work the students would encounter there. He could not be present at these work sites and therefore had no chance to demonstrate the work process to them. In these cases, other craftsmen were guiding the students and were the ones to

transfer the tacit knowledge of the craft to them. The teacher believed that the documentation system in OLKWEB could help strengthen the student's understanding of the task in future professional exercises. This understanding, according to the building and construction teacher, would be further strengthened by specifying each construction project with all its related sub-tasks, which again points back to goals in the national curriculum.

Documentation of Task with Teacher Feedback and Evaluation

In the following I will provide some examples of the documentation carried out by students in the program for technical and industrial production and of the teachers' feedback in OLKWEB as entered in the work performance rubrics and in connection with the learning objectives, as well as teacher comments and approval. First are three examples of student documentation in OLKWEB and the teacher's feedback given as information and guidance:

Example 1:

> Student: Today I spent time with someone who showed me how to use an automatic planer. When I had learned how to use it, I logged what he and I had done and what he had shown me.
>
> Teacher: Great, Kristian! But take some pictures next time and see if you can't find some learning objectives that are focused on documentation and quality. This applies to all tasks health, environment, and safety (HES) routines, etc.

Example 2: (a different student in a different company)

> Student: Cut and prepared fittings for connection. Moved 9.6 meters of 3" pipe down to 3 C (production department, my comments), aligned for connecting and full welding of acid-resistant steel. [He refers to several different learning objectives.]
>
> Teacher: Good, Johan, but explain the company's organisational structure and the department's position and function in the company. You have to expand on this for me.

Example 3:

> Student: We've gone through the HES routines. I'm very interested in health and safety because of the stories I've heard about how quickly things can go wrong and a little because of my own experience about how fast things actually go wrong.
>
> Teacher: It's good that you've got something out of this, but you are lacking a description of the work, feel free to take pictures of the work and any schedules. The pictures can be entered here.

In example 1, the teacher prompted the student to formulate learning objectives that related to the tasks. By doing so, he encouraged the student to think about the wider context of her work, thereby pointing to the relational tacit knowledge according to which the task should be understood. In example 2, the teacher asked the student to reflect on the context within which the task should be seen and understood. In example 3, the teacher instructed the student to reflect further on what she did and to explain the tacit knowledge that is related to her work. In these three examples, the teacher initiates a dialogue with the students that encourages them to make the tacit knowledge they have practised explicit.

The data show both precise and completed forms and less precise and partially completed forms. These examples illustrate how electronic documentation of performed work can contribute to greater professional awareness, both among the students and teachers. This is because actions become evident in the text and images, and on top of this, the student and the teacher converse physically in the classroom as to whether the work has been done, documented, commented on and rated. The aspects of tacit knowledge that have been expressed here are action, reflection, and interaction.

Joint Review in Plenary in Classrooms

In the data, I found several classroom observations that show how the teacher used the projector to show the whole class a student's solution to a task in OLKWEB and used this example as a starting point for a discussion on the task. This method can promote learning and development both for the student, who was given the assignment, and the other students in the classroom. Several students asked for feedback and received elaborate comments that

teachers had given on similar tasks. They also asked more questions concerning tasks where they had been in the same workplace with fellow on-the-job-training students.

Discussion

Research Question 1

The teachers and students who were interviewed and observed were quick to report on tasks they had carried out, and they received a quick response from their teacher. This response can initiate a dialogue that could be used to elaborate on the issue at hand and further the student's reflection on the subject in question. It was easy for the student to report from home or from the workplace. Pictures could be used easily since all the students had a mobile phone with a camera and knew how to operate it well. Writing on a keyboard is easier for most of these students than using pencil and paper. It is also much easier to store and access reports in OLKWEB than paper reports. All teachers know how easy it is for a student to lose or forget papers. I found that the teachers' use of OLKWEB enhances the communication between the teacher and students compared to traditional paper-based communication.

When OLKWEB improves communication between teacher and student, it is fair to assume that it also enhances the students' reflections and mastering of vocational knowledge compared to traditional paper-based communication. However, the data do not provide any direct statements from the students or the teachers about this aspect of the research, so I cannot answer this part of the first research question.

Research Question 2

What characterises a learning management system like OLKWEB is that communication between teacher and student is formalised and explicit; whereas elements of experience and action knowledge will be tacit in the sense that they cannot be verbalised. The teacher gave the assignments in writing and linked them to a curriculum goal. The students then performed the task/work and reported on what they have done in writing or with the help of photographs.

Schøn (1983) believed that learners develop greater skills through example learning in training. Example learning is based on the idea that the learner ascertains how the teacher performs work operations and then performs those operations under the teacher's supervision and guidance while receiving feedback from the teacher. Tacit knowledge is transmitted through acting. My data and observations show that it is possible to transfer tacit knowledge in many ways. The data show that the students must verbalise what they have done when writing a report in OLKWEB about what the work assignment was and how it was performed. This verbalization in writing means that the students must conceptualise what they have done and reflect on it. The contextual, functional and phenomenal structure of the work also must be explained (Johannessen & Olsen, 2008). This structure helps to make tacit knowledge explicit. The requirement for formalisation and making things explicit encouraged the students to convert their tacit knowledge into explicit knowledge. In the context, the transfer and integration of tacit knowledge is based on the development of relationships between teacher and student, based on trust and the teachers' basic helping attitude. Such a trusting relationship was present between the students and teachers that I observed.

Summary

Two questions were formulated. The first one was partially answered by the data that indicated that the use of OLKWEB enhances the communication between teacher and student; whereas, I found no data that could assert that the use of OLKWEB enhances the students' reflection on and the mastering of vocational knowledge compared to traditional paper-based communication, nor, for that matter, that it does not enhance it. The second question was answered affirmatively by the data and observations. This finding was counterintuitive as traditionally, tacit learning is transferred when the vocational learner ascertains how the teacher actually performs work operations and then performs them under the teacher's supervision and guidance with immediate feedback from the teacher. My observations and data show that a learning management system such as OLKWEB allows for the transference of tacit knowledge.

My findings indicate that documentation requirements through OLKWEB appear to strengthen the students' understanding of work tasks they will encounter as apprentices in the workplace. OLKWEB can serve as a relevant tool for enhancing students' learning. Documentation systems seem to strengthen the students' understanding of the task as a future professional skill and, in addition, also appear to strengthen the communication between students and teacher. In this communication where the vocational teacher transfers knowledge and facilitates the development and integration of experience-based and tacit knowledge through the learning management system, action, reflection, and emotional commitment are required from both the teacher and student. Tacit knowledge plays an important role in the transfer, and all three aspects – action, reflection and emotional commitment – must be present.

At the two high schools where I collected my data, I interviewed and observed three teachers and 18 vocational students. This is not a very large sample of research subjects, so my results cannot be said to be representative of vocational education in Norway. On the one hand, this is one limited study with a limited number of participants. On the other hand, however, a strength of the study is that it includes both students and teachers at different schools who have experience of using OLKWEB. This study indicates that the use of learning management systems represents progress in education. However, more comprehensive studies are needed, for example, one that compares different documentation systems to one another, while ensuring a greater breadth in both the number of participants and more and different vocations and trades included in the sample composition. Hopefully this study will inspire further and more comprehensive research into this field.

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CHANGING PERCEPTIONS OF PRE-SERVICE EDUCATORS THROUGH SERVICE-LEARNING

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Abstract: *Despite the worldwide increasing prevalence of students with disabilities (SWD) in the general education environment, pre-service educators (PSE) are still reporting negative attitudes before and after taking coursework regarding SWD. Service-learning may be one method for improving the perceptions of PSEs towards SWD. Prior research has not investigated service-learning for PSE with SWD using change and transformative theory to understand changes. The purpose of this mixed methods study was to determine whether a service-learning activity positively influences PSE perceptions regarding the inclusion of SWD in the general education environment using a modified sentiments, attitudes, and concerns protocol. Results indicate that PSEs can positively change their perceptions concerning SWD in their future classrooms.*

Keywords: pre-service educator, service learning, special education

Introduction

Worldwide, mixed results regarding the inclusion of students with disabilities (SWD) in the general education environment have been reported. For example, the United Nations Educational, Scientific, and Cultural Organization [UNESCO] (2018) found that persons with disabilities in 49 countries ages 15-29 years old "are less likely to ever attend school...more likely to be out of school...*less likely to complete primary or secondary education*...have fewer years of school, and...less likely to possess basic literacy skills" (p. 30, emphasis added). In another report, data compiled from 33 European countries between 2012 and 2015 on the inclusion of SWD in the general education environment suggested an increasing trend: 243,650 more SWD are participating in the general education environment (European Agency for Special Needs and Inclusive Education, 2014). Data reported by various countries, such as Australia (Dempsey, 2011), Canada (Jahnukainen, 2011), and South Africa (Walton, 2011), corroborate the findings of the European Report; however, the data only identify the number of SWD receiving services and not the location of services. A parallel trend can be found in the inclusion rates of SWD in the United States, which saw an increase of 188,180 SWD receiving services in the general education environment for 80% or more of the school day between the 2011-2012 school year (U.S. Department of Education, 2013) and 2014-2015 school year (U.S. Department of Education, 2015). One reason for this discrepancy in findings may be due to how each country defines "disability" (UNESCO, 2018). Regardless the variability in definitions, the findings suggest SWD are increasing their access to the general education curriculum. Therefore, in-service (i.e., licensed) and pre-service (i.e., training to become) general educators need to know how to teach SWD in their general education classroom.

One outcome of these worldwide increasing trends has been a focus on

identifying the attitudes, perceptions, and concerns of general educators regarding the inclusion of SWD. Historically, a lack of expertise, resources, and support have been identified as factors that contributed to the reasons why in-service general educators in the United States were unable or unwilling to meet the needs of SWD in their classroom (Scruggs & Mastropieri, 1996). More recently, researchers have continued to find that in-service general educators are still expressing reluctance to include SWD in their classrooms, whether they teach in the Republic of Korea (Hwang & Evans, 2011) or in the United States (de Boer, Pijl, & Minnaert, 2011). In-service general educators in Cyprus further reported that these perceptions towards inclusion exist due to a lack of adequate training (Symeonidou & Phtiaka, 2009), while those in the United States suggested that hands-on training would be more important in improving those perceptions (Logan & Wimer, 2013). These findings suggest that the inclusion of SWD continues to negatively affect perceptions of in-service general educators worldwide (Chao, Forlin, & Ho, 2016; Gavish, 2017; Subban & Mahlo, 2017).

Similar attitudes, perceptions, and concerns can also be found among pre-service educators throughout the world (Costello & Boyle, 2013; Forlin, Kawai, & Higuchi, 2015; Mangope, Mannathoko, & Kuyini, 2013; Sharma, Simi, & Forlin, 2015). For example, Costello and Boyle (2013) reported Australian pre-service educator (PSE) attitudes towards inclusion significantly declined while completing their coursework. A lack of knowledge and training were also identified as issues for PSE in Botswana (Mangope et al., 2013). Several ways educator preparation programs (EPP) have addressed the knowledge deficit is by infusing both general and special education curricula into one course (Taylor & Ringlaben, 2012) or creating units that specifically focus on inclusive education (Kraska & Boyle, 2014). To address training deficits, EPPs have provided specific training experiences embedded within a student teaching requirement (Golmic & Hansen, 2012), a graded practicum/field experience (McHatton & Parker, 2013), or a service-learning component tied directly to the coursework (Lucas & Frazier, 2014; Melekoglu, 2013). This last approach, service-learning, warrants further attention in that its outcome is to benefit both pre-service general educator and SWD (Maynes, Hatt, & Wideman, 2013).

Service-learning is used internationally across a variety of field and education settings to bring about change and growth in the individual and in society (Jacoby, 2015). The term service-learning is commonly used along with terms such as community service and experiential education. However, there are distinct differences in outcome and purpose for each term. Community service is a form of volunteerism wherein the main benefit is for the community as the student performs activities that do not necessarily extend or apply learning but provide service to individuals or agencies. Students may receive some learning benefit, but the main goal is to support the community. Conversely the focus in experiential learning is to primarily benefit the student through activities such as field work or internships. The main benefactor is the student who is applying or practicing skills learned from training into real world situations, and the agency is supporting extended learning. In service-learning the student and the community contribute to and mutually benefit from activities that are intentionally designed to provide value and transformation to both parties (Jacoby, 2015). Service-learning relies heavily on reciprocity and reflection to meet the student's learning needs and the community service needs (Maynes et al., 2013).

The benefits of service-learning have been demonstrated in the academic, personal, social, and citizenship development of college students. Conway, Amel, and Gerwien (2009) conducted a meta-analysis of 103 studies and found a moderate effect size for academic outcomes (d = .43), a small effect sizes for personal (d = .21), social (d = .28), and citizenship outcomes (d = .17). Celio, Durlak, and Dymnicki (2011) also conducted a meta-analysis of 62 programs that included elementary, secondary, and postsecondary participants. Of the five outcomes measured, a moderate effect size was found for academic achievement (d = .43) and small effect sizes were found for attitudes towards self (d = .28), attitudes towards school and learning (d = .28), civic engagement (d = .27), and social skills (d = .30). Furthermore, Lockeman and Pelco (2013) found college students who engaged in service-learning typically earned more credits, earned higher GPA, and graduated at higher rate than nonservice-learning peers.

The addition of service-learning in EPPs in the United States has increased (Bates, Drits, Allen, & McCandless, 2009). Service-learning for PSEs has been used in physical education (Galvan & Parker, 2011), English-language arts (Rattigan-Rohr, He, Murphy, & Knight, 2014), science and mathematics (Yang, Anderson, & Burke, 2014) programs. Regarding inclusion specifically, several researchers identified the positive effects of service-learning on the attitudes and perceptions of both general and special educators (Lucas & Frazier, 2014; Melekoglu, 2013). Melekoglu (2013) examined the impact of service-learning on inclusive attitudes and awareness among Turkish PSEs. Participants were expected to observe SWD in educational environments for ten hours over a five-week period and interact with both students and teachers. Data from reports generated by the PSEs indicated positive changes in viewpoints towards SWD. Lucas and Frazier (2014) also investigated the impact of a service-based course on American PSE attitudes towards inclusive instruction. PSEs in a service-based course on diversity were each assigned a group of K-12 students for the semester. Possible service-learning activities included tutoring, homework assistance, critical thinking activities, and interviews with parents. Analysis of data from posttest administration suggested PSEs who participated in the course had slightly higher attitudes towards inclusion and more favorable understanding of inclusion benefits.

Kaye (2010) identified five stages of effective service-learning programs that could be implemented within K-12 settings: (a) inventory and investigation; (b) preparation and planning; (c) action; (d) reflection; and (e) demonstration. While the five stages were from a K-12 perspective, they have been extended to the higher education setting (Chambers & Lavery, 2012; Coffey & Lavery, 2015) and, more specifically, to EPPs (Bates et al., 2009) in America. Service-learning within the higher education setting aligns with the transformative service-learning model (Kiely, 2005) in that adult learners make choices (Stenhouse & Jarrett, 2012), voluntarily participate (Bickford & Reynolds, 2002), critically reflect on their and others assumptions (Kiely, 2005), engage in meaningful relationships with individuals (Boyle-Baise et al., 2006; Kiely, 2005; Morton, 1995), and meet community-identified needs (Kretzmann & McKnight, 1996). Thus service-learning should directly impact the perceptions of pre-service general educators towards the inclusion of SWD.

Purpose

Of the two studies previously reported that incorporated service-learning into coursework (Lucas & Frazier, 2014; Melekoglu, 2013), they neglected to follow the outline provided by Kaye (2010)

regarding effective service-learning programming, in particular with an activity outside the special education environment. The purpose of our study, therefore, was to address the missing component in order to determine whether service-learning activities positively influences United States PSEs' perceptions regarding the inclusion of SWD in the classroom. The questions posed were

1. What effect does service-learning have on the sentiments, attitudes, and concerns of PSE regarding the inclusion of students with disabilities in the classroom?
2. How can transformation theory help guide understanding PSE perceptions?

Method

A mixed methods design was used to better understand PSE perceptions before and after service-learning activities. To identify the changes in perceptions, a one-group pre/posttest design (Glanz, 2014) was used in conjunction with questionnaire and an open-ended summary reflection to give insight into transformational shifts. The mixed methods approach was selected to provide data that would inform of PSE perception changes and data to inform why change did or did not occur. Pre/post surveys are often used for comparison in determining if a change occurred because of treatment (Gall, Gall, & Borg, 2010) while individual narrative descriptions are useful in understanding of perceptions within the study context (McMillan & Schumacher, 2010). The narrative low-inference descriptions allowed for investigation of meaning in application of theory (Gall et al., 2010).

Participants

Participants were from two introductory education courses designated Community Engaged Learning (CEL) at a university situated in the northwestern United States with a population of approximately 25,950 students. Nearly one half of the university students identify ethnicity as Caucasian, almost 10% as Hispanic, and approximately 1.5% as African American, international, and Asian and Pacific Islander each. About 1.5% of students identify as members of two or more ethnic groups and 0.5% as Native American. CEL courses require at least 15 hours of service-learning throughout the semester. Both courses are exploratory courses and require a summation reflection (Kaye, 2010; Kiely, 2005) on service-learning as part of coursework. Two of the research investigators were also course instructors. Students in these courses were primarily freshman and sophomores and usually in the process of applying for formal acceptance into the EPP for elementary, secondary, special, and early childhood licensure. Freshman and sophomore students are thought to benefit more from service-learning opportunities than are upper level undergraduates (Roldan, Strage, & David, 2004). Both events under investigation were options to complete the mandated service-learning hours (Stenhouse & Jarrett, 2012). All PSEs who wanted to take part in the service-learning activities could and were also invited to participate in the study. Twenty-one undergraduate PSE students participated in the events, and 14 voluntarily completed both pre- and post-surveys. Of the 14 participants, six participants were secondary education majors, five were elementary, and three were special education majors. Nine participants were female and five were male. Four participants reported they had no experience teaching SWD prior to the service-learning events, one reported high levels of experience (more than 30 full days), and nine reported some teaching experience with SWD.

Instrument

PSE attitudes towards the inclusion of SWD were measured using the *Sentiments,*

Attitudes, and Concerns about Inclusive Education Scale-Revised [SACIE-R] (Forlin, Earle, Loreman, & Sharma, 2011). The SACIE-R uses a 4-point Likert response scale with anchor labels for all 15 statements ranging from strongly disagree (SD) to strongly agree (SA) and includes a section for demographic information. The statements represent three subscales: sentiments, attitudes, and concerns. Each subscale consists of five statements that address how pre-service educators would engage with exceptional students (sentiments), accept students with different support needs in their classrooms (attitudes), and address concerns about inclusive education for SWD (concerns). Cronbach's alpha results as reported by Forlin et al. (2011) suggest a good level of internal consistency when measuring sentiments (.75) and overall combined factor (.74) and a moderate level of internal consistency when measuring attitudes (.67) and concerns (.65). The survey was presented electronically and modified to include a final open-ended question. Similar consistency results using Cronbach's alpha were found for sentiments (.73), attitudes (.65), concerns (.82), and overall combined factor (.86) in the current study.

Procedures

Two different events that met a community-identified need (Kretzmann & McKnight, 1996), a family night and a spring dance, were options available for PSE to select for this research. Course instructors apprised PSE verbally in class or through class emails of activities to complete a portion of service-learning requirements. Both projects were designed to provide opportunities for PSEs to willingly interact with SWDs outside of traditional special education settings (Boyle-Baise et al., 2006; Kiely, 2005; Morton, 1995) and followed two of Kaye's (2010) five stages: preparing/planning and action. For the first event (i.e., family night), PSEs prepared, planned, and taught a developmentally appropriate learning activity for a child (ages 3 to 22) with Down syndrome. Total time of this event was two hours. Family night participants were assigned a SWD: (a) secondary teaching majors were assigned to older children (ages 13 and above); (b) early childhood students were appointed to younger children (ages below 5 years); and (c) elementary student majors were matched with children aged 5 to 12. The three-hour spring dance at a specialized school involved PSEs preparing and dancing with young adults (ages 18 to 22) with severe disabilities. PSE were not matched with children at the dance. Print and oral information about the events and applicable child information from parents were shared with participants. The pre-survey was completed electronically within two weeks prior to or when arriving at events while the post-survey was completed within two weeks after events. Summary comments were individually read and sorted to provide further explanation of statistical results.

Results

Results indicate that PSEs can positively change their perceptions to be successful in including SWD in their future classrooms, connections to change and transformative theories were made, and involvement in this type of service-learning activity may have contributed to improved perceptions of working and interacting with SWD.

Sentiments

Five statements in the survey instrument asked respondents to indicate sentiments towards SWD (see Table 1). Overall, the sentiments of PSEs towards SWD improved. In terms of sample means, a positive change occurred from pre- to post-administrations in survey statement #2. Three respondents indicated they were more likely to dread the thought of ending up with a disability, nine reported no

difference, and two reported they were less likely to dread the thought. A negative change occurred when looking at the sample means for survey statements #5, #9, #11, and #13. Five respondents indicated they were more likely to increase the amount of time engaging in contact with people with disabilities, eight reported no difference, and one was more likely to decrease contact time. Four respondents were less likely to feel terrible if they had a disability, nine reported no difference, and one was more likely to feel terrible. Three respondents increased in their disagreement of being afraid to look directly at a person with a disability and eleven reported no difference. Finally, four respondents were less likely to find it difficult to overcome initial shock when meeting people with severe physical disabilities, nine reported no difference, and one was more likely to find it difficult.

Table 1
Sentiments of Pre-Service Educators towards Including Students with Disabilities

		Pre (n = 14)		Post (n = 14)	
#	Statement	M	SD	M	SD
02	I dread the thought that I could eventually end up with a disability.	2.21	.893	2.29	.914
05	I tend to make contacts with people with disabilities brief and I finish them as quickly as possible.	1.86	.663	1.57	.514
09	I would feel terrible if I had a disability.	2.57	1.02	2.36	.842
11	I am afraid to look directly at a person with a disability.	1.43	.514	1.21	.426
13	I find it difficult to overcome my initial shock when meeting people with severe disabilities.	1.64	.842	1.43	.756

Note: Mean response ranges from 1 to 4 (strongly disagree, disagree, agree, strongly agree).

In addition to data gathered quantitatively, participants were asked to share their feelings about being appreciative of the opportunity to participate in the events and being able to work directly with SWD. In the words of one participant, "I thought it was an amazing experience and I am very glad we were given the opportunity to go. It is not something I would have ordinarily signed up to do…". Another says, "It made me realize they were not that different and enjoyed the same things." Still another indicated, "I really loved going....and just generally a more accepting, understanding person of people with disabilities."

Attitudes

Five survey statements asked respondents to indicate their attitudes towards SWD (see Table 2). Overall, the attitudes towards SWD improved. According to sample means, a positive change occurred from pre- to post-administrations for survey statements #3, #8, #12, and #15 while a negative change occurred for statement #6. Two respondents indicated they were more likely to include students who have difficulty expressing thoughts verbally in a regular class, ten reported no difference, and two were less likely to include. Five respondents were more likely to include students who require communicative technologies in regular classes, seven reported no differences, and two were less likely to include. Four respondents were more likely to include students who frequently fail exams in regular classes, seven reported no differences, and three were less likely to include. Finally, four

respondents were more likely to include students who need individualized academic programs in regular classes, eight reported no difference, and two were less likely to include.

Table 2
Attitudes of Pre-Service Educators towards Including Students with Disabilities

		Descriptive			
		Pre (n = 14)		Post (n = 14)	
#	Statement	*M*	*SD*	*M*	*SD*
03	Students who have difficulty expressing their thoughts verbally should be in regular classes.	2.64	.633	2.71	.726
06	Students who are inattentive should be in regular classes.	2.79	.699	2.57	.756
08	Students who require communicative technologies should be in regular classes.	2.50	.650	2.71	.825
12	Students who frequently fail exams should be in regular classes.	2.43	.646	2.50	.855
15	Students who need an individualized academic program should be in regular classes.	2.43	.646	2.57	.852

Note: Mean response ranges from 1 to 4 (strongly disagree, disagree, agree, strongly agree).

Overall participant responses indicated strong feeling about the importance of including SWD. One participant shared, "She was aware of the situations going on around her and made it apparent she was capable to do things on her own that any 9 year old could do as well". Another reported, "It made me realize that they were not that different, and enjoyed the same things".

Concerns

Five survey statements asked respondents to indicate concerns towards SWD (see Table 3). Overall, the concerns of PSEs towards SWD improved. In terms of sample means, a positive change occurred from pre- to post-administrations when looking at the survey statement #14. Two respondents indicated they had a greater concern regarding their lack of knowledge and skills required to teach SWD, and twelve reported no difference in concerns. A negative change occurred survey statements #1, #4, #7, and #10. Four respondents indicated they were less concerned that SWD would not be accepted by the rest of a class, nine reported no difference, and one reported more concern. Four respondents were less concerned that it would be difficult to give appropriate attention to all students in an inclusive classroom, eight reported no difference, and two were more likely to be concerned. Three respondents were less concerned that their workload would increase if they had SWD in their class, eight reported no difference, and three were more concerned. Finally, four respondents were less concerned that they would be more stressed if they had SWD in their class, nine reported no difference, and one was more concerned.

Table 3
Concerns of Pre-Service Educators towards Including Students with Disabilities

		Pre (n = 14)		Post (n = 14)	
#	Statement	M	SD	M	SD
01	I am concerned that students with disabilities will not be accepted by the rest of the class.	2.64	.745	2.43	.514
04	I am concerned that it will be difficult to give appropriate attention to all students in an inclusive classroom.	2.71	.611	2.57	.852
07	I am concerned that my workload will increase if I have students with disabilities in my class.	2.57	.852	2.50	.760
10	I am concerned that I will be more stressed if I have students with disabilities in my class.	2.43	.646	2.24	.975
14	I am concerned that I do not have the knowledge and skills required to teach students with disabilities.	2.14	.949	2.36	.841

Note: Mean response ranges from 1 to 4 (strongly disagree, disagree, agree, strongly agree).

Some participants realized it will take work planning for SWD. One indicated, "I disliked not having time to get to know her family and her. The extra time would have helped us bond more". Another participant shared, "it showed a small portion of the diverse challenges that those who teach these children…".

Discussion

Interpretation of the quantifiable results is augmented by narrative responses to the final survey question. The concise narrative statements of participants offered additional, albeit limited, insight for understanding some survey responses within each area (sentiment, attitudes, and concerns) in relation to theory and previous work. On four of the five survey statements, PSEs were more likely to engage in longer contact, not feel terrible if they had a disability, be able to look at someone with a disability, and not be shocked when encountering someone with a severe disability. Although the majority of PSEs did not change sentiment responses from pre- to post-administration, the positive change that did occur for three respondents suggests the service-learning activity had some impact. "I was privileged to meet…. and see the different personalities and talk with the children." "I am glad I got to work with those kids that night." The personalizing nature of service-learning provides relationships to develop even within a short time (Kiely, 2005). That most respondents did not change in their response after participating in the service-learning may indicate the need for deeper reflection for participants to understand their uncritical attitudes and assumptions (Mezirow, 2000). Such an interpretation supports previous work that a critical reflective dialogue, either individual or group, is necessary to reframe participant perspectives (Bickford & Reynolds, 2002; Boyle-Baise et al., 2006; Kiely, 2005; Stenhouse & Jarrett, 2012).

Of note is the increased dread that participants could eventually end up with a disability. One reason for the heightened dread might be due to the information acquired from coursework; with increased knowledge came realization of the limitations that people, particularly school-age children with disabilities, encounter in their everyday lives. Participation in the service-learning activity may have

furthered this realization as PSEs saw firsthand the effects of a disability on the child and families.

Regarding attitudes towards SWD, responses to four of the five survey statements indicate that PSEs were more likely to include students in a regular class who have difficulty expressing their thoughts verbally, require communicative technologies, frequently fail exams, and need an individualized academic program. Similar to the results presented in the sentiments discussion, the majority of PSEs did not change in responses from pre- to post-administration. However, positive change for some respondents further corroborate that the service-learning activity was influential in positively changing attitudes towards including SWD in their future classrooms. "It was a very good experience and I'm glad I had the opportunity to participate." The finding that PSEs were less likely to include students who are inattentive (see survey statement #6) is curious and may be answered by looking at work by Gao and Mager (2011) finding that PSEs "persistently hoarded negative feelings about children with behavioral disabilities" (p. 92). Such explanation corroborates earlier discoveries wherein teachers reported inability to manage all students (Cook, Cameron, & Tankersley, 2007) or provide needed attention to all students (Stoler, 1992).

The concerns of PSEs' abilities to include SWD appeared to decrease after participating in the service-learning activity on four out of five survey statements. Respondents indicated they were less concerned that SWD would not be accepted by classmates, it would be difficult to give appropriate attention and work load or stress would increase. "It made me realize that children with disabilities are not always hard to deal with, even though some people say that." Decreased concerns suggest that service-learning was influential in helping to improve inclusion of SWD in future classrooms.

Negative changes in some results are thought-provoking. The results corroborate that dissonance and time engaged (less than three hours) in the events was low. When participants experience greater the dissonance there is a more opportunity for pronounced change. Statements such as "It really opened my eyes about teaching students with disabilities. I'm happy I did it" do not indicate an internal struggle (Kiely, 2004) but rather an awakening of understanding. Pre-service educators may have also viewed the service-learning as charity (Morton, 1995) or volunteerism (Jacoby, 2015), rather than advocacy. Viewing as charity is seen in comments that the events' purposes were entertainment rather than education. "I really enjoyed it and had lots of fun." "It was a great time! The children were so much fun."

Another interesting finding is from survey statement #14 wherein the concerns appear to increase after participation in the service-learning. One possible reason may be that PSEs recognize providing appropriate instruction to SWD is more involved than originally perceived. After acquiring introductory course knowledge and applying within service-learning, PSEs found they needed more direction and/or instruction to appropriately engage with SWD. Such concerns are conveyed in the following comments "I was worried that I did not prepare correctly" and "I just wish I knew how to better interact and teach them". These comments verify previous work wherein in-service general educators reported a lack of adequate training (Symeonidou & Phtiaka, 2009) or support (DeSimone & Parmar, 2006) in working with SWD. The awareness of lack of skills or abilities may have created tension for participants and thus tempered positive changes from service-learning with the realities of life (Kiely, 2004).

Limitations and Recommendations

Despite the overall positive findings from this study, several limitations still exist. From a design perspective, the small sample size and moderate response rates suggest caution when interpreting the results. Bigger sample sizes may allow for parametric analysis (i.e., paired samples *t*-test). Probability sampling (e.g., stratified random sampling) may also provide an opportunity to randomly assign PSEs into groups (control, experimental) for between subject comparisons (Aronson, 2006). While the findings provide initial evidence for the effectiveness of service-learning in an EPP, further research is warranted.

A second presenting limitation is the lack of opportunity for participants to critically and deeply reflect on the experience directly. While assigned course work does include reflection of the entire service-learning requirement, there was not specific instruction or set time to reflect specifically on these events. Further investigations should include opportunities for deeper reflection before and after service-learning (Bickford & Reynolds, 2002; Jacoby, 2015). The need, therefore, still exists to conduct research that aligns with Kaye's definition of service-learning in evaluating the changes in attitudes and perceptions of PSEs towards inclusion.

Another limitation lies within the procedures. Participants may have demonstrated pretest sensitization after they completed the pre-survey (Vogt, Gardner, & Haeffele, 2012). Because the participants were afforded the opportunity to willingly participate, they more likely were conscious of their own attitudes (Boyle-Baise et al., 2006) or assumptions (Kiely, 2005), and therefore knowledge of what the researchers were analyzing may have influenced their performance on the posttest. One possible solution would be to conduct the experiment again using a Solomon four-group design.

Conclusion

Those who participated in the described service-learning activities demonstrated positive, albeit small, growth in their sentiments, attitudes, and concerns regarding the inclusion of SWD in their classrooms. Given the variety of terms and implementation practices used with service learning, a broad generalization of positive influence on PSE is the most appropriate portrayal of implications for global teacher preparation. Future research that addresses the limitations of the study should provide a more accurate and representative understanding of the impact of service-learning on PSE as they continue their path towards a teaching career.

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ENGLISH AS A FOREIGN LANGUAGE TEACHERS' PERCEPTION OF EFFECTIVE FEEDBACK

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Abstract: *Giving effective feedback to students has been identified as a key strategy in learning and teaching, but we know little about how effective feedback is comprehended by teachers. Using a range of data sources, this qualitative interpretive study examined how 10 teachers of English as a foreign language from seven lower secondary schools, teaching grades 7-9, with students aged 12-14 in the Czech Republic, perceived effective feedback to be in relation to student learning and how these feedback practices influenced these perceptions within the classroom. The findings showed that teachers perceived formative nature of feedback to be effective; however, most teachers' feedback practices were found to be archaic in nature. Additionally, the study hypothesizes that this ineffective practice of teachers' feedback was mostly influenced by contextual factors such as institutional, educational, cultural, and social norms. Furthermore, the findings showed some feedback types are overemphasised, while some are underutilized.*

Keywords: EFL teachers, classroom feedback, effective feedback perception, contextual factors

Introduction

Most research in the past focused on how to give effective feedback in order to promote learning (Black & Wiliam, 1998; Hattie, 2012; Hattie & Timperley, 2007). While giving of effective feedback is important, the importance of effective *feedback perception* cannot be ignored (Brown & Remesal, 2017). Hence, teachers' understanding of effective feedback is proved to be crucial as teacher's perceptions about the quality of the feedback matter as to how feedback is planned and implemented in the classroom (Brown, Harris, & Harnett, 2012). Furthermore, research indicated that teacher's perceptions are useful in understanding and explaining classroom issues (Diaz, Martinez, Roa, & Sanhueza, 2010).

Despite the importance of how feedback is perceived, relatively little research examining English as a foreign language (EFL) teachers' perceptions of effective feedback practices in relation to student learning and how these practices influence their perceptions in the Czech Republic has been carried out. This study aims to address this gap. The following research questions guided the study:

1. What do teachers perceive to be effective feedback?
2. What feedback practices influence this perception?

Theoretical Underpinning

A wide range of education research support the idea that by integrating feedback into teaching, we can produce greater learning (Black & Wiliam, 1998; Bransford, Brown, & Cocking, 2012; Gamlem & Munthe, 2013; Hattie, 2012; Voerman, Meijer, Korthagen, & Simons, 2012). In educational research, feedback is understood as information given by an agent such as teacher, peer, book, parent, self, and experience with regard to aspects of one's performance or understanding (Hattie & Timperley, 2007). In this study, feedback is explained as effective information provided by the teacher to monitor and scaffold learning.

Hattie and Timperley (2007) and Sadler (1989) claimed that the main purpose of feedback is to reduce discrepancies between current understandings and performance and a goal. Positioning to this, Hattie and Timperley (2007) stressed the need for teachers to provide more evaluative information in their feedback as a means of providing specific helpful information. This idea was further extended by Shute (2008) whereby she explained specific feedback as one that provides information pertaining to the accuracy of specific responses or behaviours. These elements are important when it comes to giving effective feedback. Furthermore, Hattie and Timperley (2007) identified four types of feedback: feedback task, feedback process, feedback self-regulation, and feedback-self. It can be understood that feedback can be effective if the first three types are given regularly rather than the feedback-self. Following this reasoning, Clynes and Raftery (2008) suggested feedback should be constructive and not destructive in nature.

Research indicated the usefulness of feedback on student learning and the importance of teachers' understanding in delivering quality feedback. For example, Hattie (2012) pointed out the effects of feedback in his meta-analyses study on various strategies that have influenced student achievement. The effect sizes suggested that some types of feedback are more powerful than others. A central purpose of formative feedback is to bridge the gap between present performance and a desired goal when moving to the next step in learning (Hattie & Timperley, 2007; Sadler, 1998). Hattie (2012) pointed that this bridging is possible only if it involves students receiving information about a task and how to do it more effectively, while lower effects were related to praise, rewards, and punishment.

Additionally, Schartel (2012) revealed that feedback should be delivered in an appropriate setting, focusing on the task and not on the individual, and that it should be specific and non-judgmental. This structure is important because researchers point out that feedback leads to learning gains only when it includes guidance on how to improve, so that when students have opportunities to apply the feedback, they will understand how to use it and are willing to dedicate effort (Black & Wiliam, 1998; Hattie & Timperley, 2007; Kluger & DeNisi, 1996). Furthermore, Hoy and Hoy (2003) posited that "with older students (late elementary through high school), written comments are most helpful when they are personalized and when they provide constructive criticism" (p. 268).

In another video-based analysis of lower secondary classroom study has shown that quality of teacher feedback is essential for students' learning (Gamlem & Munthe, 2013). Although the lessons analysed were characterized by positive classroom atmosphere, feedback was found to be more encouraging in nature than learning-oriented. To consider feedback merely in terms of encouraging is impractical. Feedback should rather embody the effects it can have on learning. For instance, in the case of praise, Dweck (2009b) asserted that praise (process praise) related to effort puts students in a growth mind-set, which results in excellent performance and improvement. On the other hand, praise related to intelligence puts them in a fixed mind-set, leading to poor performance because they have lost their confidence, resilience, and motivation. Subsequently, Gamlem and Smith (2013) claimed that the value of feedback varies in terms of giving, using, appreciating, and seeking.

Although, effective feedback is critical in enhancing learning, both international (Gamlem & Munthe, 2013) and Czech-based research (Straková & Simonová, 2015; Organization for Economic Cooperation and Development [OECD], 2013) called attention to a number of issues

with regard to teachers' feedback practices. For instance, feedback to date is found to be ineffective (Black & Wiliam, 1998; Kyaruzi, Strijbos, Ufer, & Brown 2018), and teachers rarely ask quality questions (Black & Wiliam, 1998; Seden & Svaricek, 2018; Smart & Marshall, 2013), neither do they actively promote feedback seeking (Gamlem & Smith, 2013; Winstone, Nash, Parker, & Rowntree, 2017). Apparently, feedback is more general in nature than learning oriented; hence, teachers need more knowledge on quality aspects of formative feedback interactions to support learning (Gamlem & Munthe, 2013; Seden & Svaricek, 2018)

In the Czech Republic, effective feedback rarely occurs, even though students are tested by both externally-based examinations and ongoing formative assessments (OECD, 2013). Straková & Simonová (2015) indicated that in Czech schools, feedback given to students was not immediate, and the types of feedback were often in the form of marks or brief comments. For instance, marks are used as a means for communicating the status of students' learning but not as the basis for measuring their understanding or determining how much they have learned or how to render support for bringing improvement. In addition, little emphasis is placed on providing effective feedback to students (OECD, 2013; Seden & Svaricek, 2018; Straková & Simonová, 2015).

Recent studies indicated that although learning progress did not differ, feedback was perceived as more useful in the formative assessment condition, self-efficacy was greater, and interest tended to increase (Rakoczy et al., 2018). In another study, Skovholt (2018) examined the anatomy of teacher-student feedback in upper secondary school in Norway, and the finding showed that the teacher used questions to establish a basis to promote her own agenda and worked to optimise students' contributions by providing positive feedback and minimising critiques and disagreement; while, the student approached the teacher's feedback with resistance. This finding indicated that both the teacher and students need to be taught how to give and receive feedback effectively and constructively as providing effective and explicit feedback is crucial in improving learning (Black & Wiliam, 2009). What is more, Jónsson, Smith, and Geirsdóttir (2018) revealed that the stronger the culture around formative assessment, the stronger the dialogue between teachers and students.

To sum up, research concludes feedback as an integral part of the educational process. However, till date there is a substantial gap in the way feedback is provided, received and experienced by both the teacher and students (Jónsson et al., 2018). Therefore, if feedback is understood as information delivered to improve learning, then teachers' understanding of effective feedback practices in relation to student learning and how these practices influence these perceptions is essential for it to have desired effect on learning. Hence, the current study intends to contribute to existing knowledge on teachers' perception of effective feedback.

Research Method

The method adopted for the study is a qualitative interpretive approach as it allows the researcher to make sense of meanings others have about the world (Richardson, 1997). Data consisted of interviews together with lesson observations and document analysis of student work, which were used to develop the interview guide and to achieve a better understanding of teachers' perception of feedback practices in relation to student learning. The lesson observations were not recorded though notes were kept throughout. The observation was conducted prior to the interviews to learn more about EFL teachers' perception of effective

feedback practices and to seek explanations and clarification to classroom observation and student work during the interviews with the teachers. One of the aims of this study was to contribute to further understanding of teachers' effective feedback practices, and so the research design was developed with the purpose to investigate how effective feedback is perceived in relation to student learning.

Interviews were held in late fall 2017 and early spring 2018. An interview guide was used, and the interviews were semi-structured (Kvale, 2008) developed from existing theory on classroom feedback practices utilized in lower and elementary classes. The interviews were recorded and lasted 60 to 90 minutes.

Research Context, Participants, and Data Collection

The participants were 10 EFL teachers from Czech lower secondary schools. The participants taught EFL to students between the ages of 13 and 15. The feedback in the context of English as a foreign language was being explored as the majority of the feedback practices in EFL are mostly based on theories, research and textbooks, unlike in many other subjects. In addition, the abundance of international studies on feedback in connection to EFL provided us the avenue to compare findings from this study with those of the international studies.

The participants' teaching experiences ranged from 2 to 20 years. At the beginning, a purposeful sampling strategy was employed to elicit rich and in-depth information of an expert sample (Creswell, 2011). However, after the first few interviews, snowball sampling was used to recruit participants for the study as it allowed the researcher to reach informants by way of contact information that was provided by other informants (Noy, 2008). Emails were sent to schools and in most instances directly to the teachers requesting them to participate in the study.

A total of 15 classroom observations were made, depending on the availability of the teachers. Five teachers were observed twice while another 5 were observed once owing to their busy schedule. The researcher kept notes on all 15 observed lessons. About 33 documents, including gap filling tasks, essays, portfolios, and other test materials were analysed.

Data Analysis

Data analyses followed a thematic approach where interview transcripts and notes from the researcher's classroom observation and document analysis were written and coding categories from teachers' interviews were developed (Creswell, 2007; Kvale, 2008). All interviews were transcribed verbatim, and data were coded manually. Data were categorized based on collective patterns that emerged through repetitive reading and during coding. Further data on the themes were supplemented by studying the documents of the students. The reliability of the data was validated by triangulation of the sources; for instance, what was found to be interesting or unclear during the classroom observation was recorded in the notes and was pursued for more clarification and explanation during the interview. The coding and analysis of findings were confirmed by an expert. Consequently, two themes emerged on EFL teachers' perceptions of feedback: (a) effective feedback beliefs; and (b) feedback practices and their influence on teacher perceptions.

Findings and Discussion

The findings are discussed based two themes that emerged during the analysis: (a) feedback beliefs; and (b) feedback practices and their influence on teacher perceptions.

Feedback Beliefs

A wide range of feedback practices were prevalent including verbal, non-verbal, written feedback, grades, symbols, positive, negative, praise, and gestures, and all of these can be characterized by the following features: general, written, descriptive, specific, and timely. However, the empirical data revealed that EFL teachers focused strongly on verbal feedback and grading. In addition, some teachers also made use of symbols such as stickers, tweets, smileys, and pictures with comments along with negative and positive feedback in the form of black dots, plusses and some negative words but in a constructive manner. Teachers also gave general comments and praise related to the learner and tasks as feedback.

Teachers provided these opinions during a variety of activities related to grammar and vocabulary lessons students carried out. The activities included writing, reading, speaking, and listening exercises from the workbook, textbook, magazines, audio records, text-embedded tasks, and teacher-designed tests. The writing activities included mostly essays, tests, gap filling exercises projects and portfolios, and were provided individually. The reading exercises were mostly based on text and articles and were discussed either in the group or with the whole class. The speaking activities included sharing their responses on the tasks or tests and sharing their views on the articles. The dialogue activities were also initiated amongst pairs and groups. Students were also encouraged to speak with their teacher and peers to enhance their speaking competency. The listening activities involved mostly gap filling tasks, question and answer sessions based on the short stories or dialogue from recorded audio selections.

For teaching and learning to be effective teachers must find ways to communicate how students learn and one such technique of communicating student learning is through teacher feedback. As pointed out by Hattie and Timperley (2007), teacher feedback does seem to vary in its power. Some feedback was found to be more influential in its effect on improving learning. In general, the EFL teachers were quite aware of this and, as seen from observed lessons and from teacher interviews, the teachers generally and mostly offered feedback in a 'whole class situation.' They perceived this type of feedback as an effective method to address common mistakes made by the students. They also provided individual feedback mostly to address specific mistakes made by the individual students. The following comments illustrate this:

> I have learnt that if their performance is good, I can praise them in front of the whole class and if it is bad, it's better to say so on a one-on-one basis. (Taylor)
>
> Mostly, I survive on a kind of one-on-one based conversation, asking them what they understand, what they don't understand and if I think they know the answer or anything of that sort. (Debbie)

In addition, grading is practiced extensively by teachers as they understand that the use of grade scales as feedback is central, as the scales have their own purposes. One of the teachers used marks to connect learning with hard work and practice. The teacher added that the purpose of the scales was to cater to these learning differences. For instance, if they work hard they will get better marks, and if they don't they get lower marks. Hence, marks were used for this purpose and which in turn validates preceding research (Black, Harrison, Lee, Marshall, & Wiliam, 2004; Straková & Simonová, 2015). Their exploration showed that informed marks were used as a means for communicating the status of a student's learning, but not as the basis for understanding and determining how much a student has learned nor how to render

support for bringing improvement. Additionally, Pla-Champas, Arumi-Prat, Senye-Mir, and Ramirez (2018) claimed that students who have been assessed using formative feedback practices achieve higher marks than those who had not been assessed in this way. Furthermore, the teachers stressed that grading learners' performance was a dominant means to substantiate the accountability of students, teachers. and schools but not necessarily for improving teaching and learning.

Although the EFL teachers ascertained that written feedback was crucial, most of the students' documents and researcher's notes from classroom observation showed that teachers' written feedback comments were rather vague, often representing spelling corrections, error corrections, ticking, crossing out, verifying responses, and no suggestions for furthering learning were made by the teachers. In the class as well as in written work, teachers' comments were mostly encouraging and general in nature, such as *well done, good, good job, excellent, work hard, great, you are getting there, interesting view, not bad, try harder, you guys are on fire today*, etc. This general feedback goes against findings by Harris, Irving, and Peterson (2008), which maintains that written, specific feedback is important as it lets students know what they need to work on in order to improve. Hence, written feedback should address information about the processes underpinning the task and strategies students should use to improve their own work as suggested by (Hattie & Timperley, 2007) in their study.

To give general feedback and to consider feedback merely in terms of encouraging is futile, and studies revealed that feedback should suggest the effects it can have on learning Gamlem & Munthe, 2013). The following statement is an example of such nonspecific feedback given by one teacher:

> When I check their exercise book and I tell them, yes, this is very nice, use colours which is nice, makes it neat and everything, but if a pupil's handwriting is not neat, I tell them to do it more neatly the next time. (Martha)

Nonetheless, the teachers perceived such feedback as effective in motivating students to work harder.

A few teachers considered giving effective written feedback to be vital as they noted this kind of feedback is useful in honing the learning process. Therefore, they specifically wrote small notes that reflect students' weaknesses (what went wrong), strengths (what they did right), and solutions (what needs to be done) as observed in students' work. This finding was in agreement with other research supporting the notion that feedback leads to learning gains only when it includes guidance on how to improve (Black & Wiliam, 1998; Black et al., 2004; Hattie & Timperley, 2007; Kluger & DeNisi, 1996).

There were some teachers who perceived praising after small successes to support learning was important. For instance, the teacher observed that when a student performs a task correctly, the teacher believed that praise like *well done, you guys are on fire, you got the preposition, right*, etc., motivated the learner to do better. Hence, they regarded it to be useful especially if the praises were related to the task and not to the person. This praise was also apparent in most observed classes and observation notes; whereby, students reacted actively and quickly in the class discussion when teachers made those small praises. This reaction is consistent with Dweck (2009a), whose research found that praise related to the person impedes learning, while praise related to the task and effort might raise motivation, effort, and consequently, performance. Dweck (2009b), however, also affirmed that the praise should not be universal, nor should it praise intelligence, but rather it should boost the learner's effort. In some way, though, the finding of our study contradicts

this notion, as the praises offered in this study seem to be mostly nonspecific; however, the teachers still need to improve their strategies of giving constructive and suggestive feedback that would enhance learning rather than giving general praises as feedback. This, of course, is also necessary, but a more effective learning-oriented pointer should also be supported.

Influence of Feedback Practices on Teacher Perception

Most participants indicated that their beliefs do not influence their assessment practices, but rather are influenced to a large degree by educational, institutional, social, and cultural factors. The findings showed some of their assessment practices do seem to influence these perceptions. Hence, the contextual factors are found to be critical when teachers interpret influence of feedback. Fulmer, Lee, and Tan (2015) and Goldstein (2017) claimed that teachers' thinking about assessment (feedback) tended to reflect the social, historical, and cultural priorities established in each jurisdiction in which they were employed and so interpreting assessment requires paying attention to contextual factors operating in the given jurisdiction with particular reference to both social norms and educational and institutional policies (Remesal, 2007). For instance, giving grades alone is generally accepted by teachers as not effective because it does not contribute to further learning. They informed the researcher that they use grades and verbal feedback as they are mandated in the institutional and educational policies.

Furthermore, considering the cultural and social factors, more emphasis is placed on grading, as students', teachers', and schools' performances are determined by the grades students obtain. Moreover, there is a strong culture amongst teachers, students, and parents to judge their child's performance based on grades. This finding agreed to the findings of Black et al. (2004) that indicated that parents assume grades are the only forum through which they can find out how their children are faring at school.

Although written feedback is considered useful, the overall findings revealed a lesser use of this medium, and this result was attributed to factors including institutional policy, heavy workload, student numbers, and time constraints. Some teachers stated that non-verbal feedback, including change in tone, hand gestures and facial expressions are useful because it acts as a tool for them to alert students to their mistakes as the following statement illustrates:

> I let them think about their mistakes or the sentence once more. For example, saying is it really like that or are you sure or I repeat some sentence with different intonation to make them think about the sentence once more and I think it's enough because they notice it by themselves. (Halep)

As indicated by the teacher, the observation data and classroom notes revealed the teacher implementing such practices in her class. Furthermore, the data also revealed students engaging and reacting to such practices to improve their learning.

Some EFL teachers maintained that feedback should be formative in nature so it can serve the purpose of learning and so they modify their instruction according to the needs of the students to further their learning. Hence, the observation as well as the interview data showed the teacher carrying out three rounds of assessment to meet the desired learning goals. The teacher practiced self-, peer, and teacher assessment which, according to the teacher, meant students went through three levels of reworking their activities before the final versions were submitted to the teacher. Black and Wiliam (1998) and Hill (2011) asserted that such activities allowed students to think, discuss, and reflect on their own learning as well as on the learning

of their peers and to articulate their reflections and to provide feedback to each other. What is more, such methods increased interest and willingness to learn, enhanced reasoning skills, refined meta-cognitive skills, and improved results (Clark, 2012; Romero-Martin, Fraile-Aranda, Lopez-Pastor, & Castejon-Oliva, 2014).

A few teachers expressed the importance of taking learning forward and thus, in one school, the three EFL teachers created assessment rubrics to assess and guide the students' written tasks. Following the rubrics, teachers provided detailed written feedback to the students indicating what, where, and how they could improve in their writing. This feedback aligned with Hattie and Timperley's (2007) second and third types of feedback that explained the feedback process and feedback self-regulation. They also involved the students in this assessment process; whereby, students were made to do self- and peer-assessment of their work following these rubrics. This process agreed with findings by Parr and Hawe (2017) that pointed to peer feedback as useful in confirming and validating what they had been thinking, as cueing or surfacing existing knowledge, or as prompting reflection. Tierney (2014) saw making assessment rubrics transparent and involving students in the assessment process as a multifaceted quality of classroom assessment fairness. Turning to the assessment rubrics, students also needed to justify why they gave that choice for themselves. Gamlem and Smith (2013) claimed that giving quality academic feedback might be challenging if students were not trained for this type of feedback, or if assessment criteria were not understood. When teachers were asked whether the students could use the rubric in self- and peer-assessment, the teachers insisted that the learners must be showed how to use them; otherwise, the rubrics may not serve their purpose. However, the teachers mentioned that sometimes students' feedback was rather harsh and forceful; wherein, the teacher needed to intervene. Hence, Gamlem and Smith (2013) suggested that teachers should deliberately teach their students feedback giving skills, structure the classes to share this expertise, set criteria, and make specific feedback interventions to ensure all students can benefit from these peer interactions. One teacher stated,

> And, if they are doing a writing assignment or if they are doing a test, then I use marking schemes or rubrics and I make notes about what they have done correctly, what they have done incorrectly, where they need improvement, how they can be helped. For major assignments, I actually type up detailed notes about each criterion that they are being assessed on and hand them out to them, so they can see it and work on it for further improvement. (Paul)

Voerman, Meijer, Korthagen, and Simons (2014) claimed that feedback may elicit positive and negative, activating and deactivating emotions. These emotions will influence learning in anticipated ways. In general, positive feedback evokes positive emotions and negative feedback negative ones. Some EFL teachers rewarded students with plusses or positive comments in order to support learning as opposed to negative comments, as it can demotivate the learner from doing better. The following statements expressed by the teachers affirmed this concept:

> For example, I use only plus points not minus. I don't like it when somebody says you have these many mistakes. It's better to say you have been good at something because it's the best motivation for students, but then, I must pay attention to their mistakes as well. (Jen)
>
> Yes, for example, what usually does not work is just negative assessment. So, even if the assessment has to be negative, because the person really did

not perform well, I try to find something positive. (Tom)

The current study's findings were also similar to that of Kluger and DeNisi (1996) that found both positive and negative feedback can enhance learning if given constructively.

Conclusion

The aim of this paper was to explore EFL teachers' perception of effective feedback practices in relation to student learning. This practice was discussed from the perspective of EFL teachers by discussing two themes: (a) the effective feedback beliefs, and (b) the influence of feedback practices on this perception. The findings revealed many interesting perceptions regarding effective feedback in relation to student learning. The study also revealed overemphasis of some feedback types and under emphasis of other feedback types. Although, there were few teachers who perceived formative nature of feedback as important and effective, most teachers' perceptions of effective feedback are out-dated, and those perceptions significantly differed from the literature.

Based on these findings, we conclude by emphasizing that if the purpose of feedback is to enhance learning, then, teachers' perceptions on effective feedback has to be formative in nature. Hence, we propose a need to introduce programmes that orient teachers on the ways of giving effective feedback. Nevertheless, as the limitation our study was in terms of focus and design in exploring EFL teachers' self-expressed perceptions, a comprehensive future study is recommended which can explore different typographies regarding teachers' perceptions on effective feedback.

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USING AFTER SCHOOL PROGRAMME TO IMPROVE MATHEMATICS ACHIEVEMENT AND ATTITUDE AMONG GRADE TEN LOW ACHIEVERS

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Abstract: *Importance of mathematics in technological development of any nation requires that more attention be given to students with consistent failure in the subject. This study established the effectiveness of an after school programme among low learners in mathematics. Pre- and post-test, control group quasi-experimental design was used for the study. Participants (grade 10, ages 14-15 students) who scored 40% and below in the diagnostic assessment were selected across the four schools for the experiment. Two schools each were randomly assigned to control (conventional) and treatment (use of diagnostic assessment followed by the after school programme) groups. A total of 95 participants (49 males and 46 females) formed the sample for the study. Four research instruments were used. A t-test was used for the analysis. No significant difference in students' achievement and attitude was evident before treatment; however, there was significant effect of treatment on students' posttest mathematics achievement* $t_{(93)}=9.22, p<0.05$ *but not on attitude. Teachers are encouraged to use diagnostic assessment to identify students with learning needs and use after school programme to enhance their performance.*

Key words: diagnostic assessment, after school programme, low learners, intervention programme

Background to the Study

The number of courses for admission in Nigeria universities that do not require at least a pass in mathematics is reducing on yearly basis. Thus, students without good knowledge of mathematics will find it difficult to progress in their education. It is even possible to have some students in science classes in secondary schools dreading mathematics, not to talk of students in art, social, and commercial classes that see mathematics as an abstract subject. Some of these students have difficulty in basic skills. Moors, Weisenburgh-Snyder and Robbins (2010) found that topics like number sense, number operations, and word problem-solving, which are basic skills in mathematics, are areas where students' difficulties and disabilities generally appear. Therefore, most researchers base mathematics intervention research on learning the basics in mathematics where low-achieving students are more vulnerable and therefore require intervention that will help them do well. The failure rate seems to be more among those with history of low achievement in mathematics (Ezeahurukwe, 2010; Umaru, 2010).

Studies (e.g., Adewale & Anjorin, 2012; Afemikhe, 1985) revealed how students could be helped with formative assessment, feedback, and remediation. Low learners with consistent low achievement may not benefit from this process because of the fundamental problem they have with the basic skills. The root cause of their failure ought to be ascertained through diagnostic assessment and reported to them before mapping out strategies to help them out of the challenge. Bardwell (1981) revealed in a study that students become intrinsically motivated and ready to improve in their learning when they are aware of the exact

problem and learning strategy that can help them. Diagnostic assessment is essential to identify specific areas of need of these students in terms of basic skills.

Diagnostic assessment is an important tool for teachers to carry out teaching assignments effectively. It involves analysing student's knowledge and skills in a particular learning aspect. Identifying students in this category and their areas of difficulty is very crucial to the success of any intervention approach. Every assessment is directed towards measuring teaching and learning effectiveness (Joshua & Ikiroma, 2013). Suwarto (2013) further emphasized the importance of diagnostic assessment in the area of understanding students' learning difficulties together with possible errors in learning. Dryn (2007) concluded that diagnostic assessment is most relevant in a subject where basic knowledge is needed to understand higher skills. Low learners are lacking in basic knowledge of mathematics and that is the reason they could not comprehend what they are being taught in class; thereby, preventing them to move at the same pace with their peers.

When students are identified with their specific areas of need for an intervention programme, they tend to concentrate on their weak areas and are at liberty to ask questions without the fear of being ridiculed. One such intervention programme that could aid better understanding among low-learners is an after school programme (ASP). ASP is a specific programme for students who are consistently performing below the expected standard in their academic school work/studies to improve their performance. It involves identification of low-achieving students through diagnostic assessment and utilizing approaches such as diagnostic testing, feedback, remediation, and additional exercises to improve performance. It also requires identifying the prerequisite or basic knowledge that is lacking through students' responses to the diagnostic assessment and then leads them to understand the basic knowledge. An intervention programme that is well organised is assumed to increase the confidence and interest of the participants and thereby increase their performance.

Literature Review

Theoretical Background

The study adopted Gagné's (1971) theory of learning. According to Gagné, the level of prerequisite skills acquired by students may differ. Therefore, instruction must meet the needs of the individual student. Gagné argued that a set of ordered intellectual skills make up an instructional plan for teaching a specific concept. Mastery of lower level skills would promote deeper understanding and acquisition of more complex skills. Though Gagné's learning hierarchy presents a fixed learning sequence, all students may not have attained mastery of lower level pre-requisite skills. This lack of foundational knowledge necessitates creating multiple entry points where different students may enter into the learning sequence. These multiple entry points require the teacher to assess students' abilities and skills to determine each student's position within the learning hierarchy in order to tailor instructions by the learning tasks. Unless instruction begins at each student's individual level, the student will not acquire the necessary skill to solve complex problems related to the learning. It is, therefore, necessary to identify students with a consistent low achievement in mathematics with their prerequisite knowledge needs in order to prepare instruction suitable for their learning.

After School Programme

An ASP is meant to complement school academic work outside regular school hour. A well-planned ASP is capable of

increasing students' confidence, competence, interest, and academic achievement gain. Mahoney, Lord, and Carryl (2005) analyzed academics and ASPs and found a significant improvement in students who participated in ASPs compared with their counterparts who did not. In ASPs, students have another opportunity with what they have been taught during school day and the materials they have seen. It gives them another chance to listen more attentively and interact effectively with the necessary materials. According to Malone (2007), a well-prepared ASP can provide a conducive environment for the participating students.

Programmes that are demanding and provide relevant activities can provide positive academic outcomes (Shernoff, 2010). Neuman (2010) reported that after-school programmes should offer choices and foster students' talents. Low achieving students will have the choice of concentrating on those specific learning difficulty areas during an after-school programme. They will improve on these areas and thereby bridge the gap between them and their high achieving colleagues.

Diagnostic Assessment

Ajogbeje (2012) found that diagnostic assessment, feedback, and directed remediation improved achievement. Another study on the effect of diagnostic assessment and feedback approaches in enhancing achievement in mathematics found that it improved academic performance of the participants (Ofem, Idika, & Ovat, 2017). Students who are struggling to do well in mathematics every session need an intervention programme to overcome their learning challenges. When students are shown their areas of learning difficulties, correct them with timely feedback and remediation, learning increases in terms of cognitive, affective, and skill gains (Ofem et al., 2017).

Diagnostic assessments are carried out to determine specific topics that needs to be remedied (Stecker & Fuchs, 2000). Ariyo (2017) found that diagnostic assessment can identify specific content, topic, and/or cognitive deficits (e.g., remembering, comprehension or understanding, and thinking) in students. To aid in instructional design, diagnostic tests should measure students' competence on components embedded within the theoretical model of learning (Gregoire, 1997). Such diagnostic assessments identify specific deficits or persistent misconceptions in students' requisite pre-skills or knowledge. Several component abilities must be covered when developing a diagnostic assessment in a subject. Ariyo (2017) further emphasized that diagnostic assessment should be carefully constructed to give room for students to commit errors. The focus of diagnostic assessment is to know the learners' area of difficulty more than how much they know.

Students' Attitude towards Mathematics

Attitude towards mathematics is described as emotional dispositions to the subject, which could either be positive or negative (Zan & Di Martino, 2007). Students with positive dispositions are likely ready to give all it takes to understand the subject in terms of rapt attention in class, prompt response to assignment, special interest of the teacher, etc. Whereas, students with negative dispositions desire that teachers will not come for the period. They neither pay attention when the teacher is available nor are willing to do necessary assignments in the subject.

Attitude towards mathematics is seen as a multifaceted experience that is characterised by students' emotions, which are linked with mathematics. Tendency to be unwilling or eager to learn mathematics is an indication of attitude displayed towards a subject. When students are provided with appropriate intervention

programme such as ASP that could take care of their areas of need, they tend to develop positive attitude and thereby eager to be in mathematics class rather than being indisposed to the subject (Zan & Di Martino, 2007).

Purpose of the Study

Several research works have been carried out to minimize poor achievement in mathematics and negative attitude towards mathematics among low-achieving students (Adewale & Anjorin, 2012; Cunningham, 2016; Obaitan & Adeleke, 2007). However, a need exists to empirically establish the degree of the effect of an ASP on achievement and attitude of low-achieving students using a diagnostic assessment approach in identifying these low-achieving students and their areas of difficulties such as their prerequisite knowledge in mathematics. This study, therefore, used a treatment which employed systematic combination of diagnostic assessment (to identify low-achieving students and their prerequisite areas of need in mathematics) followed by an ASP to enhance their mathematics achievement and attitude.

Research Hypothesis

1. There is no significant difference in mathematics achievement of students exposed to treatment, and those without the treatment.
2. There is no significant difference in attitude of students exposed to treatment, and those without the treatment.

Methodology

The study adopted a pre-test/post-test, control group quasi-experimental design method. Two local government areas (LGAs) were randomly selected from each educational zone in Ibadan metropolis, Nigeria. Two schools each from the two LGAs were randomly selected. A total of 246 participants underwent the diagnostic assessment out of which 95 participants (49 males and 46 females) who needed an ASP were identified using a 40 percent score as the benchmark across the four schools. The schools were randomly assigned to treatment or control. Senior Secondary 1 students with an age group range between 13-15 years constituted the sample for the study.

Instruments

The following instruments were used for the study: (a) Diagnostic Assessment; (b) Mathematics Achievement Test 1 (pretest); (c) Mathematics Achievement Test 2 (posttest); (d) Pre-remediation Diagnostic Scale; (e) Remediation Instrument; and (f) Student Attitude Questionnaire.

Diagnostic Assessment. The instrument was constructed by the researcher using a test blue print. A test blue print also called table of specification helps to represent contents and cognition of targeted items in the appropriate proportion. One hundred and fifty multiple choice items with four options **(**A, B, C, D**)** were generated from junior secondary schools I, II, and III mathematics syllabi. These items are prerequisite knowledge required in Senior Secondary 1 **(**SS1**)** work. The generated items were given to mathematics experts as well as experienced secondary school mathematics teachers for vetting. After carrying out necessary amendments based on suggestions and corrections made, the items were trial tested on one hundred SS1 students from co-educational schools similar to the targeted sample to establish both the difficulty and discriminating indices of each item. These steps were taken to ensure the validity of the instrument. All the 82 items that had difficulty indices between 0.40 and 0.60 and discriminating indices of 0.3 and above were finally selected and used for the study. The reliability coefficient was determined

using Kuder-Richardson (KR-20), and the reliability coefficient was 0.89. The 82 items were systematically divided into three sections (27, 27 and 28) to contain content and cognition in the same proportion. This step was done using the table of specification systematically. The administration of the instruments was completed three times within two weeks. Any student who scored 40 percent and below consistently in the three assessments was considered a low learner.

Mathematics Achievement Test. The Mathematics Achievement Test (MAT1) was constructed by the researchers. The items were based on the first four topics in the first term of the SS1 syllabus. These topics include indices, logarithm, number system, and modular arithmetic. Out of 80 questions constructed and validated, 40 questions were selected for the study. The items were trial tested on eighty SS1 students from co-educational schools similar to the targeted samples to establish both the difficulty indices and discriminating indices of each item. Forty-one items survived with difficulty indices between 0.40 and 0.60 and discriminating indices of 0.3 and above. Forty questions were used for the study. One item from content (logarithm) with highest number of items was randomly removed under remember (level of cognition), to make the total items 40. The reliability coefficient of 0.83 was determined using Kuder-Richardson (KR-20).

Mathematics Achievement Test 2. Mathematics Achievement Test 2 (MAT2) is the parallel (re-arranged) version of Mathematics Achievement Test 1 (MAT1). At the end of the experiment, the items used for pretest (MAT1) were rearranged and administered as posttest (MAT2). The achievement test was used to assess the performance of the identified low learners at the beginning and the end of the experiment.

Pre-remediation Diagnostic Scale. These items were constructed by the researchers. They were used for the ASP group and made available for control group. The instrument was prepared on the four main topics selected for the experiment: indices, logarithm, number system, and modular arithmetic. These topics are in the first term of SS1 as contained in the ammonized syllabus of Oyo State, Nigeria. The instrument was used as a diagnostic assessment to identify lower level (prerequisite) knowledge that is lacking among the identified low learners. Responses of students to this instrument helped teachers to identify area(s) of need in the identified learners.

Remediation Instrument. The items in this instrument were constructed by the researcher and used to reinforce prerequisite knowledge in the experimental group. The items were constructed by solving the forty questions from the pre-remediation diagnostic scale developed around the four topics (indices, logarithm, number system, and modular arithmetic). Seven prerequisite knowledge concepts to the four topics were identified in the process of solving the forty items. They include (a) directed numbers, (b) simple equations, (c) inverse and identity, (d) large and small numbers, (e) approximation and estimation, (f) decimal and percentages, and (g) factorization of quadratic expressions and equations. The knowledge of these seven topics is required for better understanding of the four topics identified for the experiment. The researcher, therefore, developed items on each of these seven topics. When the teacher identified a lack of knowledge of a basic skill in the process of marking students' work, the remediation instrument was used. This step further helped students to understand the basic skills required to understand the new topics. The two instruments were used for remedial work: the pre-remediation diagnostic scale focused on the main four topics identified, and remediation

instrument focused on the prerequisite knowledge needed to understand the identified four topics.

Student Attitude Questionnaire (SQ). This instrument was developed by the researchers to elicit information on students' attitude toward mathematics. The instrument was divided into two sections. Section A included the biographic data of the respondent, while Section B was on the attitude of the student to learn mathematics. Section A was designed to elicit information about the participant's age and sex. Section B was drawn on a four-point Likert-scale response format: very untrue of me–1, not true of me–2, true of me–3, very true of me–4. The response format was reversed for negative items: very true of me–1, true of me–2, not true of me–3, and very untrue of me–4. The content validity was established, and Kuder Richardson (KR-20) formula was used to determine the reliability index of the items which is 0.74.

Treatment Procedure (TP)

Instructional guides were prepared for the research assistants who participated in the study. The guides are divided into experimental and control group procedures.

Instructional Strategy I – Experimental Group Only. The Pre-remediation Diagnostic Scale was administered to the experimental group. The feedback of students' performance in the assessment was presented to them during the following contact. Remediation of the areas noticed followed this format:

a. Teacher gave the feedback;
b. The items were divided into sections;
c. Students with highest scores lead the class;
d. Teacher allowed students to discuss and identify correct answer to each item;
e. Students could ask questions;
f. Students could provide answers to the questions among themselves;
g. Students took turns to lead the other sections;
h. Teacher guided the process and provided assistance, when necessary;
i. The teacher took students through the identified source of the problem, especially in lower level or prerequisite knowledge using the remediation instrument; and
j. The teacher gave more exercises from remediation instrument to ensure better understanding of the prerequisite knowledge.

Experimental Group (ASP). Two schools were used in this group. The research assistant administered the diagnostic assessment to identify areas that required remediation. The feedback of the assessment was presented to the group during the next contact and properly remediated using the treatment procedure outlined above. Lower level knowledge identified was retaught using Remediation Instrument. Additional exercises were given to students in the specific area of need (both as a group and as individuals), which could aid better understanding. See Figure 1 for the procedures used for the after school programme experimental group.

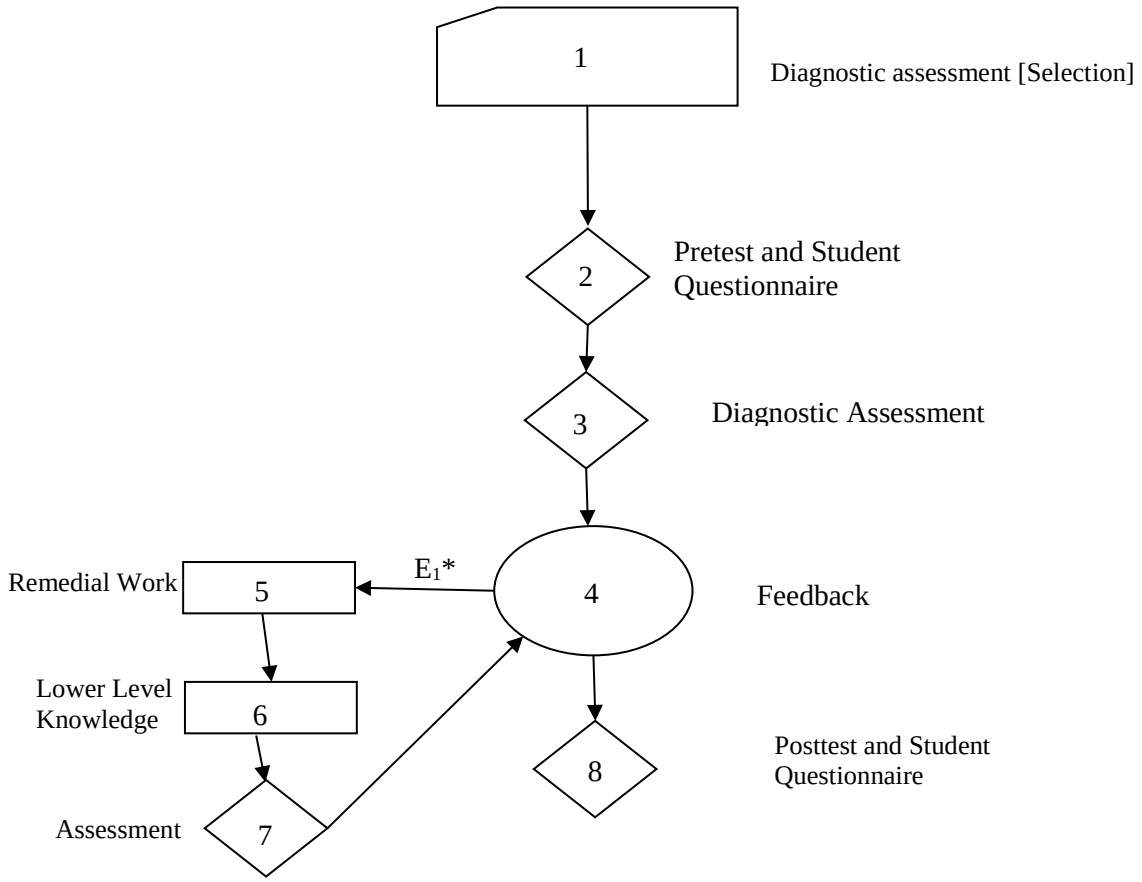
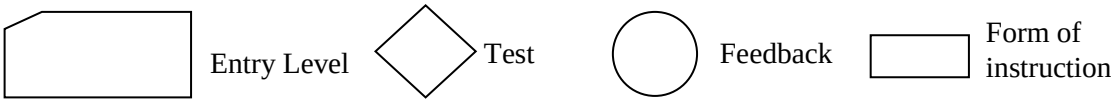


Figure 1. Schematic representation of the experimental (ASP1) procedure adapted from Adeleke (2007). *E_1 – Experimental group followed the pathway that included steps 5-7. Key is as follows:



Instructional Strategy II – Control Group Only. Diagnostic assessment was administered to the participants in control group using the Pre-remediation Diagnostic Scale without feedback or remediation.

Control group. Two schools were used in this group. Students in this group were identified using the diagnostic assessment. Research assistants administered pretest and students' questionnaire to the identified students. Participants in this group were given Pre-remediation diagnostic scale but not provided with the feedback nor remediation. See Figure 2 for the procedures used for the control group.

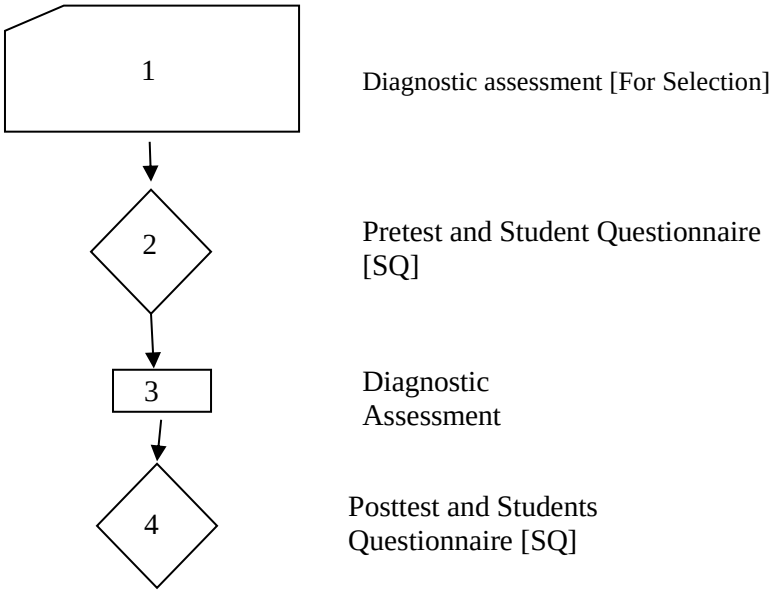


Figure 2. Schematic representation of the control group procedure adapted from Adeleke (2007). The key is the same as the one for Figure 1 with feedback eliminated.

Data Collection

All SS1 (Grade 10) students in the selected schools were given the diagnostic assessment: A mathematics assessment used to select low learners that constituted the participants for the study. MAT1 and SQ were administered to all the selected (low learner) participants as pretest. After treatment, the MAT2 and SQ were administered to all the selected (low learner) participants as post-test. The data generated were subjected to descriptive independent *t*-test.

Results

Table 1 shows no significant difference between the mean attitude of student in the experimental group (M=38.13, SD=8.44) and those in the control group (M=35.81, SD=6.49), $t(93)=1.47$ $p>0.05$. This result means that students' attitudes to mathematics in the two groups were almost the same before treatment.

Table 1
Participants' Attitudes Towards Mathematics Before Treatment

	Treatment	N	Mean	SD	Std. Error	*t*-value	Df	Sig
Pre-Attitude	ASP	53	38.13	8.444	1.160	1.47	93	0.14
	Control	42	35.81	6.493	1.002			

Table 2 shows no significant difference between the mean attitude of students in the experimental group (M=60.72, SD=7.81) and those in the control group (M=60.50, SD=6.41), $t(93)=0.15$ $p>0.05$. This result means that students' attitudes to mathematics in the two groups were almost the same after treatment.

Table 2
Participants' Attitudes Towards Mathematics After Treatment

	Treatment	N	Mean	SD	Std. Error	*t*-value	Df	Sig
Post-Attitude	ASP	53	60.72	7.811	1.073	0.15	93	0.88
	Control	42	60.50	6.417	.990			

Table 3 shows no significant difference between the mean achievement of students in the experimental group (M=10.53, SD=3.11) and those in the control group (M=11.69, SD=3.07), $t(93)=-1.82$ $p>0.05$. This result means that students' achievement in mathematics in the two groups were almost the same before treatment.

Table 3
Participants' Achievement in Mathematics Before Treatment

	Treatment	N	Mean	SD	Std. Error	*t*-value	Df	Sig
Pretest	ASP	53	10.53	3.111	.427	-1.82	93	.072
	Control	42	11.69	3.072	.474			

Table 4 shows a significant difference between the mean achievement of student in the experimental group (M=18.42, SD=3.62) and those in the control group (M=11.71, SD=3.38), $t(93)=9.22$ $p<0.05$. This result implies a significant effect of treatment on students' achievement in mathematics. Therefore, the null hypothesis is rejected.

Table 4
Participants' Achievement in Mathematics After Treatment

	Treatment	N	Mean	SD	Std. Error	*t*-value	Df	Sig
Posttest	ASP	53	18.42	3.624	.498	9.22	93	.000
	Control	42	11.71	3.381	.522			

Discussion

The analysis showed neither initial significant difference before treatment in students' attitudes towards mathematics nor after treatment. Despite the differences among the treatment groups, the main effect was not significant. This finding could be as a result of the time frame for the intervention programme and the peculiarity of the participants (low achievers) as it is generally believed that changing a long time decision, belief, or attitude could be difficult especially for low achieving students who probably have sustained negative attitudes. The finding of this study agreed with a study by Cunningham (2016) who considered an elementary after school enrichment program to improve students' attitudes toward school and found that students' attitudes actually declined between the pre- and post-survey periods. However, through qualitative data analysis, students did hold a positive attitude toward school and found the enrichment experiences enjoyable. Cunningham's finding corroborates the findings of Apara and Yoloye (2014) who found no significant main effect of treatment on students' attitudes towards chemistry. However, these findings were contrary to a study by Obaitan and Adeleke (2007) who found a significant effect of treatment on the attitude of mathematics students.

There was no significant difference in students' achievement in mathematics between the group that benefited from ASP and the comparable group at the start of the experiment. However, by the end of the treatment, the difference in students' achievement between the two groups was significant in the favour of the group who experienced the ASP. Participants in the ASP group had higher mean gain in achievement than those in control group. This result may not be unconnected with the fact that students were made to identify the source of their errors and an appropriate remedy was provided. This finding corroborates the finding of Ofem et al. (2017) that diagnostic assessment, feedback, and directed remediation improve achievement. When students are aware about the source of their errors through diagnostic assessment and appropriate solutions provided, they are better motivated to improve. This result implies that students with adequate knowledge of source of mistake will want to guide against it in the subsequent attempts.

Educational Implications and Recommendations

Based on the findings of the study, the following recommendations are made.

1. After-school programmes should be provided for low-achieving students in mathematics to care for their deficiencies.
2. More teachers should be employed for proper implementation of intervention programmes, such as after-school programmes for low-achieving students.
3. Teachers should be allowed to go for seminars, workshops, and conferences to update their knowledge on adaptation of special instructional interventions like ASP in the classroom.
4. Parents should be encouraged to allow their children to participate in the intervention programmes whenever the school sees the need for it because they usually come up after school hours.

Conclusion

The effectiveness of the ASP with the components such as diagnostic assessment, feedback, and remediation with enhanced prerequisite knowledge could afford low achievers the opportunity to re-build their foundational knowledge in mathematics. It was also discovered that proper identification of low achievers through diagnostic assessment is germane for successful implementation of intervention programmes. Thus, students with special needs should be identified and taught using instructional strategies that will meet their peculiar needs.

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PUBLICATION GUIDELINES

The journal (*JISTE*) publishes articles by members of the International Society for Teacher Education (ISfTE). Exceptions are made for a non-member who is a co-author with a member, or who is invited to write for a special issue of the journal, or for other special/specific reasons.

- Articles submitted to *JISTE* must be written in English, following manuscript guidelines (see below) and will be anonymously reviewed by referees. Each article must pass the review process to be accepted for publication. The editors will notify the senior author of the manuscript if it does not meet submission requirements.
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- All text should be double-spaced with margins 1 inch (2.5 cm) all around and left justified only.
- Paragraphs should be indented using the "tab" key on the keyboard. No extra spacing should be between paragraphs.
- Tables, Figures, and Charts should be kept to a minimum (no more than 4 per article) and sized to fit between 5.5 x 8.5 inches or 14 x 20 cm.
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Book and Other Media Review Submission
Reviews of books or other educational media are welcome. Either the review or the item reviewed must be by a current member of ISfTE. Reviews must be no longer than 1000 words.

Annotation of Recent Publications by Members Submission
ISfTE members may submit an annotated reference to any book which they have published during the past three years. Annotation should be no longer than 150 words.

SUBMISSION REQUIREMENTS

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Future Issues and Submission Deadlines

2019 (Volume 23, Number 1) – Submissions no longer being accepted.
Theme – *Teacher Education in the Post Nation Era* was the theme chosen by the conveners of the 38th seminar for ISfTE held at Joetsu University of Education, Japan, May 2018. For JISTE publication, participants have been invited to revise their seminar papers, attending carefully to the manuscript and publication guidelines, and submit them to the journal for consideration. Book reviews on the theme are also invited.
Publication by May/June 2019

2019 (Volume 23, Number 2) – *Deadline for submission: July 1, 2019 – Publication by December 2019*
Open issue. We invite members of ISfTE to submit articles for this issue. Members are encouraged to co-author articles with their students or colleagues who may not be members of ISfTE. Authors who are not members of ISfTE may submit articles for this open issue. In case their articles are accepted for publication, the authors must pay membership fee to ISfTE. Book reviews and reflection papers are also invited.

2020 (Volume 24, Number 1) – *Deadline for submission: October 1, 2019 – Publication by May/June 2020*
Theme – *Teacher Education for the Next Decade: Looking to the Past to Inform the Future* is the theme for the 39th seminar of ISfTE hosted by conveners Leanne Taylor and Vera Woloshyn from Brock University, Canada. To submit your article for publication in this edition, you must first present it at the seminar to be held in May 2019. Please use the feedback given in the paper group to improve the paper prior to submission for consideration for publication.

Front Cover

These institutions' logos appear on the front cover of this issue: University of Aarhus University, Denmark sponsored the ISfTE seminar in 2017. The other institutions – Weber State University, and Brock University – support JISTE with their on-going sponsorship and/or the support of the work of the editors and officials of ISFTE. If other institutions would like to participate, please contact the journal's editor, Karen Berg Petersen.

Aarhus University is the second oldest university in Denmark. It is also the largest university in the country with over 43,000 students. It offers programmes in both undergraduate and graduate studies. Although the main campus is in the city of Aarhus, Denmark, the university has small campuses in Copenhagen and Herning.

Weber State University in Ogden, Utah, United States, was founded in 1889. It is a coeducational, publicly supported university offering professional, liberal arts, and technical certificates, as well as associate, bachelor's, and master's degrees. Currently, over 26,000 students attend the university.

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