

Student teachers' pedagogical knowledge on the inclusion of students with disabilities in practical physical education lessons in Ghana

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To cite this article:

Darko, R.A., Mwangi, J & Wachira, L.J (2022). Pedagogical knowledge of university student-teachers on inclusion of students with disabilities in practical physical education lessons in Ghana. *International Journal of Whole Schooling*, 18(1), 51-73.

Abstract

Research has identified pedagogical skills as the main skills that student-teachers need for self-efficacy and on-going development in teaching. Pedagogical skills help teachers to reflect on their ability to attain the desired professional standards for teaching. Any failure of teacher preparation programme to equip student-teachers with pedagogical knowledge effectively questions the validity of the programme. This study evaluated the pedagogical knowledge (instructional and adaptation skill knowledge) of 152 university PE student-teachers for inclusion of students with disabilities in practical physical education (PE) lessons in Ghana. The results indicated that the majority of the student-teachers expressed that they have acquired the prerequisite pedagogical knowledge of instructional and adaptation skills to include SWDs in their practical lessons yet 56(36.8%) were not able to state any adaptation skill learnt. However, a significant difference was found to exist between student-teachers' pedagogical knowledge from the two universities ($t(-6.010)$ at $df(30)$ $p < 0.05$). The study revealed that the teacher preparatory programme in the universities does not expose student-teachers to teaching and instructional strategies applicable to inclusive practical settings. In conclusion, a pedagogical knowledge aspect of instructional skills was adequate but that of adaptation skills was inadequate. It is recommended that practical course lecturers in the two departments should equip student-teachers with a well-rounded arsenal of effective teaching and instructional skills applicable in inclusive practical settings. Further studies should compare student-teachers' perceived pedagogical knowledge and actual pedagogical knowledge for inclusive practical PE teaching.

Keywords: Pedagogical knowledge, adaptation, instructional skills, physical education, inclusion, students with disabilities.

Introduction

Physical Education (PE) is considered the key aspect of quality life within the framework of education. This is due to its positive contribution to learners' generic skills, fitness, knowledge and attitudes which are very necessary for optimal development and well-being (Walton-Fisette & Wuest, 2017). An environment where learners can access PE is the school setting. Grosse (2009) reiterated that PE in schools serves as a vehicle for providing students with guided experiences that support improvement of physical health, increase motor abilities and nurture sports and leisure activity involvement. This must involve all learners, irrespective of their characteristics, ability or disability, thus the need for inclusive PE. Inclusion, according to Block (2016) is the instruction of individuals with and without disabilities together in regular classrooms with proper support and accommodations. Rusanescu et al. (2018) also viewed inclusive PE as a procedural orientation aimed at unifying the learning process with diverse groups, which include students with and without disabilities in the PE class. Many studies have indicated multiple benefits of inclusive PE, which include increasing blood flow to the brain, increasing intellectual attentiveness, sustaining a positive attitude, and averting illness (Klein & Hollingshead, 2015; Tovin, 2013; Woolfolk et al, 2015). However, all these benefits can be well achieved through methodological guidelines, curricular, attitudes and intentions of the teaching staff and stakeholders involved in the educational process that favour inclusion of students with disabilities (SWDs) (Bota et al., 2017).

Learning how to teach all students regardless of their learning ability has become a key focus of research due to the significant impact it has on the quality of teaching and learning. Teaching is said to be challenging yet a rewarding experience when recognized as a highly multifaceted process that brings together a wide array of knowledge, skills, and competences useful in an undefined world of practice (Garrett et al., 2007; Carrington et al, 2010). "Education for all" and "no child left behind" has led to the call for inclusive education globally (UNICEF, 2015). With this, Vickerman (2007) stated that as the inclusion movement continues, SWDs are enrolling in mainstream schools and as a result, PE teachers must be sufficiently educated and prepared to meet those needs. This includes appropriate personnel preparation and curriculum that provides the necessary information to PE teachers in the teaching of SWDs.

Similarly, Guerriero (2017) and Ainscow (2005) commented that the adequacy of a teacher training programme for all depends on the quality of their training in pedagogical knowledge and

experience. Guerriero (2017) emphasised that the pedagogical knowledge of student-teachers needs to be processed, evaluated and transformed to ascertain its adequacy for practice. Studies have indicated that inclusive pedagogy requires on-going development at the pre-service stage in order to heighten the self-efficacy of the student-teacher in allowing for significant opportunities for SWDs in practical PE (Pederson et al, 2014; Hodge & Elliot, 2013; Mangope et al, 2013). Loreman (2007) emphasised that curriculum is what is to be taught and pedagogy denotes the way the curriculum is to be delivered. Hence, pedagogy is key for effective teaching and learning in any inclusive setting. In this study pedagogical knowledge is looked at as instructional and adaptation skill knowledge. Instructional skill is operationally defined as the educational approaches and principles used for regular class teaching in relation to a particular lesson learning objective. Instructional skills specific to inclusion include improvisation and adaptation of facilities and equipment, consultation and co-teaching, use of demonstrations, providing opportunity for individual work, task analysis, providing great variety in the programme and modifying content to suit the needs and interests of all students (Sherrill, 2012; Liberman & Houston-Wilson, 2009).

Also, well-structured inclusive class in PE demands knowledge in adaptation. Winnick (2011) opined that successful adaptation boosts interaction, meets the needs of all students, and improves self-esteem while providing safe experiences for all. Research has identified pedagogical skills as the main skills that student-teachers need for self-efficacy and on-going development in PE to reflect their ability to attain the desired professional standards for teaching (McNeil et al., 2017; Pedersen et al., 2014; Hodge & Elliott, 2013; Mangope et al, 2013). The authors further elaborated that by ensuring excellence in learning and growth of PE teachers, opportunities should be provided for student-teachers to engage in best practices for inclusive pedagogy. However, several studies have highlighted how PE student-teachers struggle with knowing about teaching SWDs and the lack of self-efficacy in enacting inclusive pedagogy (Hodge & Elliott, 2013; Pedersen et al., 2014; Mangope et al, 2013). Hence, there is a need to evaluate what student-teachers know an inclusive practical PE class.

In Ghana, two universities have the core mandate to train PE teachers for all levels of education. The aims of the university curricula for these two institutions are to provide student-teachers with the necessary skills in pedagogy and hands-on experience. The PE teacher

preparation programme in Ghanaian universities has two dimensions, viz, a general and departmental component. With the general component, PE student-teachers take educational courses in pedagogy, counselling, and special education (SPED), among others. The departmental dimension looks at the programme area courses which are offered by the department and these are run concurrently with the general courses. As part of the departmental courses, the student-teachers are expected to take one course in Adapted PE for three credit hours during one semester. Each of these courses should therefore be geared towards inclusion since it has become a global phenomenon.

Moreover, PE student-teachers are expected to have acquired subject-matter content knowledge and pedagogical content knowledge (instructional and adaptation skills) in all practical courses, for inclusion of SWDs in their regular PE practical class. Research findings on teacher inclusive development indicate that teachers' content knowledge has appreciated at the detriment of pedagogical content knowledge, critical thinking and inquiring skills, which are the key elements of effective teaching in 21st century inclusive PE practical classes (Mohd et al., 2015). Thus, inadequacy of programmes to equip university student-teachers with competences that can enable them sufficiently and successfully include SWDs in their regular practical PE lessons in an inclusive setting, may interfere with the validity of the preparation programme, if weighed in the light of the education for all policy. In order to have effective teacher preparation programme towards inclusive education, the programmes must be geared towards the pedagogical knowledge and understanding of diversity of learning needs by the individuals in the class (Schumm & Vaughn, 1995).

Nevertheless, curricula and programmes need to be evaluated to check if they are producing workforce that actually can handle the demands of the national needs and are competent and adequately prepared for practice. This is necessary to apply to PE and especially the practical aspects since it requires a strong technical and specialized approach compared to other school subjects. However, there is insufficient information regarding whether PE student-teachers have adequately acquired pedagogical knowledge (instructional and adaptation skills) for inclusive practical teaching during their preparation programme in the universities in Ghana. This study, therefore, sought to evaluate PE student-teachers' instructional skills knowledge for inclusion of students with disabilities in practical PE lessons as well as evaluate their adaptation skill

knowledge for inclusive practical PE lessons. The study addressed the following research questions:

- a. What are PE student-teachers' instructional skills knowledge for the inclusion of SWDs in practical PE lessons in Ghana?
- b. What are PE student-teachers' knowledge about adaptation for inclusive practical PE lessons?

A null hypothesis which stated that There is no significant difference between student-teachers' pedagogical knowledge for including SWDs in inclusive PE practical lessons in the two universities in Ghana was also tested.

This study was based on Shulman's (1987) knowledge theory. Shulman knowledge theory explained pedagogical knowledge (PK) as the knowledge about the processes and practices of teaching and learning. Shulman (1987) explained that the pedagogical knowledge of a teacher is the teachers' ability to teach students in respect of their abilities which include explaining, demonstrating, and giving examples in a way that will help all students to learn. Grossman (1990) also added that teachers with adequate teaching knowledge which encompasses content knowledge and teaching method can effectively help all students to understand the subject knowledge.

Methods

The sequential mixed-method design was used for this study. This design involved the collection of data first with a survey questionnaire and later with a focused group discussion (FGD). This design enabled the researchers to use the best methods to solve the problem at stake, instead of relying on a single research method of interest (Creswell, 2014). Ethical clearance as well as permission were sought from Institutional Review Board of a university in the central part of Ghana and heads of departments of the two institutions. One hundred and fifty-two (152) level 300 student-teachers from University A and University B were purposively selected for the study because they are currently the sole universities that train PE teachers in the country. Student-teachers who indicated that they have had refresher courses in special needs education were excluded from the study. The questionnaire (5-point Likert type items) was designed by the researchers and validated (construct and content) by experts in the area of study. The research objectives (instructional and adaptation skill knowledge) for the current study informed the design

of the questionnaire. Also, the development of the questionnaire was informed from literature (Lieberman & Houston-Wilson, 2018., Sherrill 2012., Winnick & Porretta, 2017) and ideas gained from an inclusive pedagogy instrument originally designed by Gyimah (2010). Piloting of the questionnaire was done with 10 level 400 student-teachers from University B. The reliability coefficient of the student-teachers' instructional skill knowledge (13 items) and adaptation skill knowledge (6 items) scales were satisfactory with $\alpha = .71$ and $\alpha = .73$ respectively. After the piloting, corrections were made in the questionnaire before using for data collection. The questionnaires were administered to the student-teachers at their lecture halls with the help of two research assistants after they have consented to be part of the study. The researchers checked the thorough filling of the questionnaire before releasing the student-teachers. The data were clean then coded using SPSS version 25. Quantitative analysis was done using descriptive statistics of means and standard deviations presented in tables.

Based on the findings from the questionnaire, a 60-minute focus group discussion (FGD) was conducted with 20 (16males and 4 females) of the same participants who were proportionally selected. They were put into 4 groups of 5 with 1 female in each group. Participants were assured of confidentiality as well as freedom to withdraw without requital. The FGD took place in the MPhil lecture halls of University A and B respectively. Audio recordings were played back to the participants to ensure confirmability. The qualitative data were transcribed verbatim and analysed based on the research objectives. Confirmability and member checking were ensured as audio and data transcribed were confirmed with participants.

For data scoring, the scale ranged from 1 to 5 with 1 – representing Strongly Disagree, 2 – Disagree, 3 – Undecided, 4 – Agree and 5 – Strongly Agree. The average point of the scale was a score of 3. A mean score above 3 signified participants' agreement with the items on the scale while a mean score below 3 showed participants disagreement with the items on the scale. The summative index for each category of the questionnaire was derived by adding the ratings of the total number of items. For instance, the summative index for pedagogy was derived from adding the ratings of all the items for instructional skill (IS1+IS2+IS3+IS4+....IS13) and adaptation knowledge (AK1+AK2+AK3+AK4+AK5+AK6).

Results

1. Pedagogical Knowledge and Skills for Inclusive PE Teaching

1.1 Student-Teachers' Instructional Skills Knowledge for Inclusive Practical PE

Results from all the items in Table 1 indicated that the student-teachers felt they had gained instructional skills knowledge to effectively include SWDs in their practical PE lessons. This was proven by the fact that all items recorded above-average means of 3.0. The results indicated that the university preparation programme in relation to instructional skills for the inclusion of SWDs in practical lessons were perceived to be adequate in terms of task selection ($M=3.77$, $SD =1.03$), pairing of students to practice skill taught ($M=3.67$, $SD =1.04$), setting of boundaries for practical lessons ($M=4.09$, $SD=1.00$), setting instructional objectives to cater for diverse students ($M=4.26$, $SD=.91$), pace for lesson delivery ($M=4.07$, $SD=.99$) and given instructional cues ($M =3.80$, $SD =1.12$). This implied that student-teachers from both institutions believed to have gained adequate instructional skills for inclusive practical PE teaching.

Table 1: Student-Teachers' Responses on Instructional Skills Knowledge for Inclusive PE

Items	N	M	SD
1. I know how to select task/skill that SWDs can perform with their able-bodied colleagues.	152	3.77	1.03
2. I know how to pair students without disabilities with SWDs to learn/practice a skill effectively.	152	3.67	1.04
3. I know how to constantly supervise students with and without disabilities while they practice a skill.	152	3.73	1.13
4. I know how to set boundaries and demarcate the practical classroom to enhance easy movement and participation for students with and without disabilities in an inclusive practical lesson.	152	4.09	1.00
5. I know how to incorporate how students with different disabilities learn into my everyday lesson preparation.	152	3.26	1.01
6. I know how to adequately demonstrate/describe skills to students with varying disabilities in an inclusive PE practical setting.	152	3.81	1.05
7. I know how to practically assess students with and without disabilities in an inclusive practical PE lesson.	152	3.84	1.13
8. I have learnt that I have to give adequate time for all students to practice what they have learnt	152	4.44	.843
9. I have learnt to set instructional objectives to cater for students with and without disabilities in an inclusive practical lesson.	152	4.26	.913
10. I have learnt to present skills in parts to allow students with and without disabilities to learn efficiently.	152	3.94	1.05
11. I have learnt to vary the pace of lesson delivery to help students with and without disabilities learn skills.	152	4.07	.990
12. I know how to analyse skills when SWDs are practising in an inclusive practical lesson for immediate feedback.	152	3.22	.971
13. I know how to give instructional cues to students with and without disabilities in an inclusive PE practical lesson.	152	3.80	1.12

Abbreviations: N – Number of Participants, M – Mean, SD – Standard deviation

A further qualitative data was collected to ascertain the instructional skill knowledge of the participant through focus group discussion. The results from the FGD indicated that opinions expressed by most of the participants during the FGD were about the absence of SWDs during practical lessons and lack of exposure during on-campus teaching practice (OCTP). Views from some of the participants from University B were that: “For the teaching methods I will say it is mostly of demonstrations and peer teaching but not related to inclusion” (A female FGD Participant, UB 2019). A female participant was of a different opinion that: “I beg to differ in relation to how we were taken through the practical by our lecturers. I will say there was no mention of SWDs, so for that aspect of inclusion, it was only one-sided which is student without disabilities”. A male participant also said: “I will also say the instructional approach was both theory and practical, only that the practical aspect was not in an inclusive setting”. A male participant was of the view that: “You see, our lecturers don’t make mention of SWDs during our practical lessons and also, we have not been given the chance to do on-campus teaching practice with those who are in the department of special education (FGD Participant, UB 2019)”.

Opinions from University A participants were not different from that of the University B participants on the instructional methods used in their preparation programme. A male participant said, “For pedagogy, we had only one course in level 200, and it doesn’t involve SWDs”. A male participant suggested that: “I think one or two students were having problem with injuries though injuries are not the same as disabilities. Those people were not involved with the exercises we were doing. So, I think it will be better if the lecturers have used different teaching approaches for us to see how they could have been included instead of asking them to sit down and observe the lesson (FGD Participant, UA 2019)”. All these comments from the student-teachers suggests that they would have appreciated a practical lesson where alternative instructional approach was employed so far as inclusion teaching is concerned.

1.2 Adaptation Skill Knowledge of Student-Teachers for Inclusive PE

The result from Table 2 indicated that all six items addressing participants’ adaptation skills knowledge during their preparatory programme recorded a mean over 3.7. This implied that all the study participants felt they had adequate knowledge in adaptation for teaching in an inclusive setting and thus can modify equipment (M= 4.02, SD = .89), modify tasks (M= 3.74, SD= .99),

and make accommodations ($M= 3.90$, $SD = .98$) in their practical lessons to successfully include SWDs.

Table 2: Student-Teachers' Responses on Adaptation Knowledge for Inclusive PE

Items	N	M	SD
1. I understand the term adaptation and know what it entails so far as the teaching of inclusive practical PE is concerned.	152	4.34	.781
2. I know how to modify equipment to suit students with varying disabilities in an inclusive practical PE lesson.	152	4.02	.898
3. I know how to accommodate students with varying disabilities in my practical PE lesson.	152	3.90	.985
4. I know how to modify a skill/task without changing its major focus in an inclusive practical PE lesson.	152	3.74	.993
5. I know how to adapt instructional skills for varying disabilities in an inclusive practical PE lesson.	152	3.84	.906
6. I know how to modify a task when assessing SWDs in an inclusive practical PE lesson.	152	3.95	.908

Abbreviation: N – Total Number of Participants, M – Mean, SD – Standard Deviation

On the contrary, though the majority of the students from university A and university B said they had acquired adaptation skills and knowledge, however, a further result obtained from an open-ended question which had asked them to indicate in writing some adaptation skills they knew based on their preparation programme in the university showed a majority of the participants responding negatively. The results from Table 3 revealed that majority 16(64%) UA; 40 (31.4%)-UB) of the student-teachers from both institutions responded 'None', indicating that they had not learnt any adaptation skills for SWDs in the course of their preparation programme. Although university B seems to have a larger proportion of participants reporting to have adaptation skills knowledge than those in University A, however, there is still an implication of inadequacy in adaptation skills knowledge due to the 31.4% of student-teachers reporting of not having skills.

Table 3: Student-Teachers' Responses on Adaptation Skills Learnt during the University Preparatory Programme for Inclusive Practical PE Lessons

UA Open-Ended Responses	Frequency	Percent
None	16	64.0
Equipment Modification	2	8.0
Rules Modification	1	4.0
Give them enough time for skill learning	1	4.0
Small grouping for teaching task	1	4.0
Measurement of performance must be individual based	4	16.0
Total	25	100.0

UB Open-Ended Responses	Frequency	Percent
None	40	31.4
Adequate time for practice	12	9.4
Breaking down complex skills and task	2	1.6
Varying and giving clear instruction	5	4.0
Constructive positive feedback	2	1.6
Equipment improvisation	11	8.7
Equipment modification	20	15.7
Modification of rules	10	7.9
Modification of task	10	7.9
Peer teaching	11	8.7
Safe environment	4	3.1
Total	127	100.0

UA – University A, UB – University B

FGD Findings for Adaptation Knowledge to Include SWDs in PE Practical Lessons

Many of the participants from university A indicated consensually that they were not taught about adaptation in their PE programme. Nevertheless, they stated that, they could transfer knowledge from other fields such as the special needs course, improvise as well as provide support services for SWDs. Views expressed by some of the participants were as quoted below:

A male participant revealed that:

Even though we have not been specifically taught how to adapt the equipment for individuals who have a disability, I think with the knowledge we have any time we are asked to prepare lesson notes, we are asked to consider individual differences so with this knowledge or idea, I think I will try and structure the equipment in such a way that the SWD will also fit in the class. I will put the equipment in a way that he/she with disability and cannot go according to the normal procedure of the lesson will also have his/her choice of equipment. So, if, let's say, he/she is amputated where he/she can't walk and maybe he/she is in a wheelchair, I will try everything possible, that with the

wheelchair, he/she will be able to do something with it to be able to be part or to feel part of the class (FGD Participant UA, 2019).

Another male participant said:

I also think if there is the need of improvising something or some of the equipment to suit their state of disability, that should be done. Then also, if you give the student with disability a different activity that will suit his state too, I think that one will do (FGD participant UA, 2019).

Another male participant said:

Since we have knowledge about the presence of SWDs in our class I'll have to emmm prepare ahead for them before I even go to the class. Assuming emmm I have a student with one of the legs not there and I am going to teach high jump or gymnastics, students are going to clear a certain bar or height. With the pre knowledge of that student in mind I would do my possible best to get a beat board to just help the student go through the activities successfully as alongside the students without disabilities (FGD Participant UA, 2019).

A female participant reported that:

Yes, during the lesson I will let those who are not disabled be in between them so that they will guide them. Then also, I will look for a specific exercise or activity for those with disabilities. Even though we've not been taught specifically, but I can go online, do more research and then maybe get specific activities for those people so that they will all be involved in the class (FGD Participant UA, 2019).

However, participants from University B had knowledge in adaptation skills to include SWDs in their PE practical lessons. Participants indicated some adaptation strategies such as appropriately adapting equipment for the right age and diverse disabilities, modifying rules, making equipment user friendly and improvising where necessary. Some excerpts from what they said are quoted as:

One male participant said:

My knowledge about adaptation so far is to look at the individuals with disabilities and see the equipment that will suit them in terms of practical preparation. Even though it might not be the right equipment for the lesson, but if it will suit the SWDs, then, I have to bring it on board to help them have a successful practical lesson. So, in that sense, an equipment might not be the right one for the class, but I have to adapt it to suit the disability (FGD Participant UB, 2019).

Another male participant said:

I think this one is about making the equipment friendly in terms of reducing how complex it is so that the SWDs can use it to their level, making it user friendly (FGD Participant, UB 2019).

Another male participant also indicated that:

Sometimes and most often, it's quite difficult to modify equipment, so I believe more in modifying the rules of the game but not necessarily the equipment (FGD Participant UB, 2019).

A male participant responded that:

Let's say that am teaching basketball where we have a standardised ball size and here is a case I have a person with a disability whose fingers are not stable to hold a big ball. I can adapt a handball so such a student can practise the skill I are teaching in basketball (FGD Participant UB, 2019).

A female participant said:

I will say adaptation of equipment depends on the degree of disability so maybe, we may make adjustment in the equipment to suit the level or the degree of the disability so he/she can enjoy the class as well (FGD Participant, UB 2019).

Although some of the student-teachers indicated that they had not been specifically taught how to carry out adaptation, there were, however, positive indication from their comments that they would adapt equipment, instruction and factor in general adaptation in their future practical PE lessons to include SWDs.

1.2.2 T-test Results of Student-Teachers' Pedagogical Knowledge Acquired during the Preparatory Programme for Inclusive Practical PE between the Two Universities

An independent sample t-test assuming unequal variance was conducted to establish the mean difference in pedagogical knowledge acquisition for including SWDs between PE student-teachers from the two universities. The result from Table 4 indicated that $t(-6.010)$ at $df(30)$ $p < 0.05$, with Hedges g of 1.53 was significant. This implied that much difference exists in the pedagogical knowledge and skills acquired by the student-teachers from the two universities.

Table 4: T-test Results Showing Differences between Student-Teachers' Pedagogical Knowledge for Inclusive Practical PE in the Two Universities

Institution	N	M	SD	t-test	df	p-value
UA	25	60.68	12.30			
UB	127	76.36	6.57	-6.010	30.274	.000*

*Abbreviation: t – t-test value, df – degree of freedom. M – Mean, SD – Standard deviation, Significant** $p < 0.05$: $df = 30$*

Discussion

Research has identified pedagogical skills as the main skills that student-teachers need for self-efficacy and on-going development in PE. It also equips them to reflect on their ability to attain the desired professional standards for teaching (McNeil et al., 2017). Pedagogical skill knowledge

entails content and skills in instructional strategies, methods and approaches and adaptation skills. It can be established from the findings of the present study that the majority of the student-teachers were of the perception that, they had received adequate instructional skills and, on that basis, perceived that they could successfully include SWDs in their practical PE lessons. All thirteen items reported on by the participants had high means, between 3.22 and 4.44. Student-teachers indicated that they have learnt how to give adequate time for SWDs to practice skills learnt. The lowest mean was recorded for the item on the knowledge of how to analyse skill and provide immediate feedback when SWDs are participating in practical lessons.

Student-teachers indicated that they could pair and group learners with and without disabilities to learn a skill. In such a context, the student without disability provide assistance to the students with disabilities in inclusive practical PE. In tandem with the present finding, peer teaching was found by Garrote et al. (2017) to facilitate student learning in an inclusive setting. In the same vein, inclusive pedagogy expects teachers to utilize diverse grouping strategies to support the learning of all students (Pantic & Florian, 2015). This suggests that, increasing awareness of instructional strategies for inclusion in all aspects of the training programme is vital to the sensitisation of the student-teachers for inclusive PE teaching. Effective instructional strategies should, therefore, be structured by teachers to meet all unique learning styles and the appropriate developmental needs of all learners (Meador, 2020). The implication is that practical course lecturers in the two Departments should equip student-teachers with a well-rounded arsenal of effective instructional strategies applicable in inclusive practical settings. This is essential to maximise the effectiveness of the student-teachers in seeking to increase learning opportunities for all manner of student.

Similarly, Collier (2011) holds that when deciding on the most appropriate curricular approach and activities to meet the student's learning goals, it might become apparent that adaptations and modifications of activities are necessary. This is especially the case if students with disabilities are to participate successfully. From this premise, findings revealed that majority of the student-teachers evaluated their adaptation knowledge and skills favourably in their responses to relevant items on the subject-matter. A majority of the student-teachers indicated that they understand adaptation and also can modify equipment, tasks and make accommodation to include SWDs in their practical lessons. The present finding is similar to that of Majoko (2019)

who, in his study, indicated that all participants reported adapting their teaching methods, strategies, techniques, and assessments to include SWDs in PE in mainstream classes. On the contrary, there were differing opinions when student-teachers were asked to indicate some of the adaptation skills they knew for inclusive practical PE teaching. The majority (64%) of the student-teachers from University A were not able to state any adaptation skill while 36% identified adaptation skills such as measurement of performance to be individual-based and equipment modification. As a corollary to the current finding, a study by Wang et al. (2015) revealed that only two teachers out of five reported having knowledge about adaptation and modification of instruction and equipment for students with disabilities. Forty (31.4%) student-teachers from University B were also not able to state any adaptation skill whilst 87 made mention of some adaptation skills such as modification of equipment, adequate time for practice, equipment improvisation, rule modification and task modification. These were the most profound recurring adaptation skills mentioned by the majority of the student-teachers.

In support of this current finding, Ko and Boswell (2013) strongly believe that physical educators should know how to design modifications to accommodate individual learners. This can be achieved by educators diversifying their lessons and widening their learning outcomes to make lesson goals attainable by all learners. However, a significant difference was found between the pedagogical knowledge of the student-teachers from the two universities in this present study. The null hypothesis was, therefore, rejected. This difference can be attributed to instructional skills, adaptation skills and variation in methodological experiences of the student-teachers during their preparatory programme in the universities. This suggests that the two Departments should collaborate and consolidate their programme content to reflect the demands of the Ministry of Education policy documents for teacher education in Ghana. This will be responsive to the core mandate of these two universities which train PE teachers for all levels of education in Ghana.

A further FGD involving University A student-teachers point to a contrary view that they have not been exposed to pedagogical skills and knowledge purposely for handling students with disabilities. The student-teachers went further to categorically state that, it will be difficult to include students with disabilities in their lessons since they lack the pedagogical skills to do so. In line with this current finding, several studies have also highlighted the phenomenon of PE student-teachers lagging in knowledge about teaching students with disabilities and the consequent lack of

self-efficacy in enacting inclusive pedagogy (Hodge & Elliott, 2013; Pedersen et al., 2014). In effect, this means that, to ensure effective teaching and learning and to improve the competence of PE teachers, opportunities should be provided for student-teachers to engage in best practices for inclusive pedagogy during their preparation programme.

Research has shown that the content of the initial teacher education curricular as well as pedagogical methodologies and approaches adopted by teacher educators are both crucial to teacher preparation for inclusive education (Jorgensen et al., 2011). Basically, methodologies and approaches entail the step-by-step process of delivering a lesson. This essentially informs student-teachers about the different available ways to organise equipment and materials available and overall practical lessons.

From this current study, student-teachers indicated that the instructional approaches used for their entire preparation programme was too theoretical, thereby creating a gap between theory and practice. One female student-teacher expressed the view that their practical course lecturers never made mention of students with disabilities. Another male student from University A said that they underwent some practicals but that it was not in an inclusive setting. This suggests that differentiation methodology and approaches need to be employed by lecturers in the preparation programme, in a bid to equipping student-teachers with the practical procedural approach to inclusive PE teaching. The present study finding tallies with Anapiosyan et al, (2014) who reported that 90% of teachers lacked teaching methodologies that would effectively include students with disabilities in class activities. This shortcoming often leads to either poor quality inclusion or even exclusion (Tichá et al., 2018). Thus, the lack of adequate professional education, in terms of pedagogy both in undergraduate courses and continuing education, is seen as a serious obstacle to the school inclusion process (Greguol et al., 2018; Hodge et al., 2017). This suggests that teacher education programmes have to take into account the composite of the undergraduate preparatory programmes in the university to make it viable for inclusive teaching. The reason is that the implementation of education for sustainable development will depend on competent and committed teachers who are pedagogically well equipped with inclusive ideas and concepts to operationalise it. The indicators for effective inclusion, therefore, depend on the inclusive pedagogical knowledge and abilities teachers have acquired in order to be active change agents in the inclusive settings. In application of Shulman's (1987) knowledge theory, teachers have the

responsibility to organise teaching, design learning tasks, make use of adequate resources, and understand determining factors in the teaching-learning process (da Ponte, 2011). And this is what the university preparation programme should equip student-teachers with for effective inclusive PE teaching.

Implications

Student-teachers from both institutions expressed perceived adequacy in instructional and adaptation skills knowledge for the inclusion of students with disabilities in inclusive practical PE lessons. However, the majority of the student-teachers from University A could not identify any adaptation skills learnt. A significant difference was found to exist between student-teachers' pedagogical knowledge from the two universities.

It was found that the University PE preparation programme in the area of pedagogy for practical lessons focuses much on able bodies, has no mention of students with disabilities and has not been specific about teaching in an inclusive setting. Findings indicated that practical course lecturers did not mention students with disabilities to student-teachers during PE practical lessons. This study also revealed that most methodology experienced by some of the student-teachers were in segregated schools which did not give them the real-world experience of teaching in an inclusive setting. Findings from this current study established that student OCTP does not incorporate inclusive methodologies and, thus, pedagogy experience in the university preparation programme does not involve SWDs.

The implication is that, increasing awareness of instructional skills for inclusion in all aspects of the teacher preparation programme in the university is vital to the sensitisation of the student-teachers for inclusive PE teaching. Teacher education in the universities for PE needs to provide increased pedagogical skill knowledge and experiences for student-teachers and give them the opportunity to observe, teach and implement inclusive pedagogy in PE.

Conclusion

In conclusion, pedagogical knowledge and skill aspects such as instructional skill was adequate but that of adaptation skill was inadequate. Though student-teachers indicated subjectively that their adaptation knowledge is adequate, objectively it was found to be inadequate. The study recommends that practical course lecturers and Special Education lecturers who teach

PE student-teachers Special Education and Adapted Physical Education should highlight the importance of instructional skills, and adaptation skills appropriate for practical courses in PE for inclusive teaching where applicable. Also, practical course lecturers should endeavour to give student-teachers practical alternative teaching methods and strategies for inclusive practical PE teaching. Further studies should compare student-teachers' perceived pedagogical knowledge and actual pedagogical knowledge for inclusive practical PE teaching.

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