



CHAPTER 8:

Problem-Based Learning: Priming pre-service consumer studies teachers for practical lessons

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Abstract

Teaching Consumer Studies is often complicated, particularly in practical lessons which contribute significant formal learning, but which requires the management of countless problems to ensure that learners benefit optimally. Preparation of preservice Consumer Studies teachers should, therefore, include insight into the problems experienced in real-world practical classes. In addition, teacher students should be equipped with the 21st-century skills they will need to deal with such challenges. These issues were imperative for inclusion in a recently-developed module for preservice Consumer Studies teachers, to bridge the gap – utilizing problem-based learning – between the teacher preparation program and the real-world challenges teachers face in South African classrooms. A mixed methods research design explored if and to what extent problem-based learning developed the 21st-century skills that are needed to prepare Consumer Studies teachers for real-world practical classrooms. Pre- and post-module questionnaires and classroom observations were inductively analysed. The findings showed that most students believed that the module greatly improved or developed several of their 21st-century skills and that the problem-based strategy was perceived as useful. A similar problem-based approach is recommended for subsequent Consumer Studies teacher preparation modules, particularly to develop students' 21st-century skills and to prepare them for the real-world challenges they might encounter.

Keywords: 21st-century skills; Consumer Studies; practical lessons; preservice teachers; problem-based learning

Introduction and background

“Teaching Consumer Studies is not for sissies” — an outcry often heard in South Africa. Consumer Studies shares many characteristics of the subjects Home Economics and Family and Consumer Sciences. Despite Consumer Studies sometimes being viewed as undemanding or simple by people outside the profession, several studies confirm that this elective subject in the South African high school curriculum is complex from both learners’ and teachers’ perspectives (Ngwenya & Shange, 2019; Umalusi, 2014). It is complex because of its broad and diverse theory topics – ranging from food and nutrition to housing, clothing and entrepreneurship (Department of Basic Education [DBE], 2011; Umalusi, 2014) – and because of its significant and demanding practical component (Ngwenya & Shange, 2019). Planning, organizing and managing practical lessons, including administrative tasks surrounding the construction and implementation of effective practical learning experiences, require that these teachers have to be well prepared with apposite knowledge, skills and capabilities.

The practical component includes knowledge and skills which learners apply to produce a physical product and constitutes 37,5% of the total teaching time allocated to Consumer Studies in the curriculum (Umalusi, 2014). Schools may choose one of five Consumer Studies practical production options in line with the resources available at the school, namely food, clothing, soft furnishings, knitting and crocheting, or patchwork quilting by hand (DBE, 2011), however, more than 90% choose to offer food production (Du Toit, 2018). Practical lessons are formally assessed with the aim of preparing learners for “small-scale production, entrepreneurship and

marketing of quality products” (DBE, 2011, p. 8). Therefore, the value of these practical lessons lies not only in skills development but also in developing entrepreneurship education, which is much needed in South Africa where youth unemployment is persistently high.

Nonetheless, the intended entrepreneurial benefits of practical lessons do not always reach learners because “the subject is plagued with challenges” (Ngwenya & Shange, 2019, p. 2). Challenges include insufficient infrastructure (Ngwenya & Shange, 2019); crowded classrooms (Du Toit, 2018; Inn, 2017); limited teaching time (Inn, 2017), or lack of resources (Du Toit, 2018; Inn, 2017). However, the challenge most often mentioned is inadequate training of teachers (Du Toit, 2018; Inn, 2017; Koekemoer & Booyse, 2013; Umalusi, 2014). Teacher education is often viewed as ineffective, in particular due to the gap between theory and practice. Teachers who have inadequate training for a complex subject such as Consumer Studies and who are then faced with additional real-world challenges, such as those mentioned above, will have a difficult time to effectively implement the subject, which will be to the detriment of their learners (Koekemoer & Booyse, 2013). Similar challenges are reported for Home Economics in several other countries such as Estonia (Paas & Palojoki, 2019), Finland (Niskanen, 2018), Mauritius (Pace et al., 2015), Nigeria (Uzoka & Okafor, 2010) and Papua New Guinea (Limu & Kikising, 2015), highlighting the need to explore strategies to also address these difficulties internationally. A teacher preparation module (coded VWVD 521) was viewed as a good starting point and potential vehicle to introduce strategies to help preservice Consumer Studies teachers to better grasp and manage these and similar challenges that they might face in real-world classrooms. The problem was that a module needed to be developed which would not only prepare preservice teachers for teaching a complex subject but also for the additional challenges they may face in practical lessons.

The purpose of this chapter is to report on the research that was conducted to develop a module to optimally prepare preservice Consumer Studies teachers for practical lessons by bridging the gap between their student preparation and the real world. This chapter is structured as follows: the conceptual-theoretical framework describes the pertinent concepts relevant to the research and their relation to each other; thereafter, the research methods are unpacked, followed by a discussion of the findings. Finally, based on the findings, conclusions and recommendations are made.

Conceptual-theoretical framework

Some of the 21st-century skills which Consumer Studies teachers will need in practice to cope with the challenges of teaching this subject in South African classrooms, are described below. The potential of utilizing action research, and in particular problem-based learning, to develop the required 21st-century skills in preservice teachers is then discussed. The section lastly considers the theory of social constructivism and how it brings together the aforementioned concepts.

21st century skills needed to effectively construct and implement practical lessons

The Glossary of Education Reform (GER) (2016) describes 21st-century skills as “a broad set of knowledge, skills, work habits, and character traits”, explaining that the term refers to more than just skills. This set of skills and competencies is critically important for success in the modern world, as part of education, and also in preparation for the world of work (GER, 2016). Similar skill sets are sometimes referred to using other labels, such as “essential skills” (Van Beek et al., 2014), “survival skills” (Wagner, 2014), or “soft skills” (World Economic Forum [WEF], 2018). In this paper, the term

“21st-century skills” continues to mean the broad set of skills and traits described by the GER above.

Several particular skills and traits are repeatedly designated as 21st-century skills in literature – for example, critical thinking; problem-solving; creativity; communication; planning skills; time management; collaboration; initiative-taking; self-direction in learning; teamwork and metacognition (DBE, 2011; GER, 2016; Savery, 2015; Umalusi, 2014; Van Beek et al., 2014), to name but a few. The current investigation centered on the set of 21st-century skills defined by Hixson et al. (2012, p. 8), as their set of skills aligns prominently with the skills needed by Consumer Studies teachers and are also beneficial for entrepreneurship education. Their 21st-century skillset includes: critical thinking skills; collaboration skills; communication skills; creativity and innovation skills; self-direction skills; global connections; local connections; and using technology as a tool for learning (Hixson et al., 2012).

Developing 21st-century skills as part of Consumer Studies education is essential. Consumer Studies teachers need these skills to manage demanding theory lessons and, to a greater extent, to support them in planning and presenting effective practical lessons. Wood and Nahmias (2005, p. 80) describe the skills that preservice teachers need to develop as “classroom skills”, which answers students’ questions on “how to” address various issues in their classrooms. Skills are needed to support teachers in time management; planning and managing resources; thinking critically and creatively about the saleability of learners’ products; organizing and managing collaboration between learners; solving various real-world problems before and during the practical session; and lifelong or self-directed learning as part of their continued self-development in the profession. Teachers, therefore, should develop these skills to support and enhance their teaching in the subject to keep up with the rapid changes and development

in the 21st century (Shapiro, 2017; WEF, 2018) and to enable them to develop similar skills in their learners. Hixson et al. (2012) determined that teachers whose training included 21st-century skills taught such 21st-century skills more often and more extensively than other teachers. It is also vital to prepare preservice teachers for the challenges they might face in their profession in the real world one day (McGlynn-Stewart, 2010; Shapiro, 2017). Learning that is linked to the real world will help to prepare preservice teachers for challenges and improve students' engagement in their learning, motivating students in the process (Bouw et al., 2019).

Problem-based learning is a strategy that has been employed as part of action research in preparing South African teachers with 21st-century skills in other subjects, such as computer programming (Havenga, 2016), and geography education (Raath & Golightly, 2017). Research on its use to prepare preservice teachers for Consumer Studies is, however, rare.

Problem-Based Learning

Problem-Based Learning (PBL) is an active and interconnected process of socially constructed learning (Davidson-Shivers et al., 2018). Although descriptions and definitions for problem-based learning abound, most of these include similar characteristics, which are used to design and implement problem-based learning (Shinde, 2014). Therefore, rather than offering a single comprehensive definition, the characteristics of problem-based teaching-learning strategies are elucidated here.

The core characteristic of problem-based learning is that it is a structured and active learning process based on investigating or resolving problems or complex issues (Koehler et al., 2019; Raath & Golightly, 2017). The process is student-centered and learning-focused, thus, the lecturer serves as facilitator of the process rather than a "teacher" (Savery, 2015). Students are given

more autonomy in the learning process than in traditional teacher-led classes and work self-directedly, as well as in small groups, to address or solve problems (Bouw et al., 2019; Shinde, 2014; Van Beek et al., 2014). The guiding problem(s) should be based on real-world situations and be open-ended or ill-structured (Havenga, 2016; Larmer, 2015) to make learning more meaningful for students (Van Beek et al., 2014).

Students analyse and determine what the core of the problem is; what they already know that might be relevant to solving the problem (prior knowledge); and what additional or new knowledge or skills they will have to develop to address or solve the problem (formulating learning goals). Students utilise self-directed learning as well as facilitated learning to address the learning goals they set (Larmer, 2015; Savery, 2015; Shinde, 2014). Sharing of developing knowledge and potential solutions for the problem is another indispensable characteristic of problem-based learning (Larmer, 2015; Van Beek et al., 2014), providing valuable constructivist learning opportunities. Problem-based learning strategies must be judiciously planned and structured to include all these characteristics together with developing the intended knowledge and skills in a learning program, and should integrate the development of 21st-century skills in students (Shapiro, 2017). In this way, problem-based learning could bridge the gap between education and the world of work, such as the gap between preservice teacher preparation and the skills Consumer Studies teachers will need to teach the subject in practice effectively.

Social constructivism

Topolovčan and Matijević (2017) define constructivist learning as a non-linear, self-directed and interpretive process of knowledge construction, which is informed and influenced by the learning environment. Constructivist

learning utilises authentic activities and contexts that echo how knowledge will be used in the real world, supports collaborative knowledge construction, and provides opportunities for dialogue and reflection. This allows for multiple perspectives to emerge as part of the dialogue and requires that different roles are fulfilled by the students as well as the facilitator (Herrington et al., 2007; Topolovčan & Matijević, 2017). Such different perspectives – and broader knowledge – are developed when learners and teachers exchange ideas, explain problems from their individual and collective perspectives, and then construct meaning from the process (Gordon, 2008; Wood & Nahmias, 2005).

Knowledge is therefore constructed, rather than discovered or received (Gordon, 2008). If the co-construction of learning is intended, the process has to be structured with particular emphasis on the actions of learners – both as individuals and as part of the group – as well as those of the facilitator (Davidson-Shivers et al., 2018). Rather than fulfilling a traditional role as the “giver of knowledge”, the facilitator (or lecturer) serves as one of the co-constructors of knowledge. Students are placed at the center of the learning process and become actively involved in the co-construction of knowledge (rather than just “receiving knowledge”). Each student contributes individual or shared prior knowledge, experiences or perceptions to the overall knowledge of the group, thereby creating multiple perspectives that expand the learning experience for every member of the group (Davidson-Shivers et al., 2018; Topolovčan & Matijević, 2017), which often challenges students to consider alternative views (Beckers et al., 2015). The social and interactive nature of such co-construction of knowledge is referred to as social constructivism (Davidson-Shivers et al., 2018). Rather than the traditional competitive approach to learning, collaboration and social interaction between students are emphasised in this type of learning (Beckers et al., 2015).

Social constructivist learning includes several of the features or characteristics inherent to problem-based learning, such as active learning in authentic contexts, student-centeredness, and altered roles of learners and facilitators. Problem-based learning is often directly associated with social constructivist learning (Beckers et al., 2015; Davidson-Shivers et al., 2018; Gordon, 2008; Topolovčan & Matijević, 2017). Despite Gordon's (2008) concern that constructivist learning might result in diminished connectedness to individuals, current research supports the view that social constructivist learning also relies heavily on some of the 21st-century skills mentioned earlier, such as collaboration and teamwork, but also including self-direction in learning. Since preservice teachers' experiences are often limited to their own prior encounters, collaboration will contribute to providing opportunities for broadening their perspectives and collaborative knowledge (Koehler et al., 2019). Developing and fostering these skills will, therefore, contribute to social constructivist learning reciprocally. These parallels substantiate the suitability of framing this research in the socio-constructivist theory.

Action research aspires to transform the manner in which people understand things, apply knowledge in practice or the conditions in which they function (Kemmis, 2009) and therefore can contribute to understand how knowledge and practices are constructed.

Research methods

The current study aimed to address the problem of developing a Consumer Studies teacher preparation module which would not only equip students with didactical knowledge but also prepare them for the challenges they might face in real-world practical classrooms. In other words, the construction of learning in this module had to be planned to foster the

development of particular 21st-century skills that preservice teachers would need in their real-world professions someday. Therefore, the main research question for this investigation was: How can the requisite 21st-century skills for practical lessons be developed in a Consumer Studies teacher-preparation program using problem-based learning?

Three sub-questions were used to structure and guide the investigation:

- How can a preservice Consumer Studies teacher-preparation module be scaffolded to contribute to authentic learning?
- What are students' perceptions of the use of problem-based learning as part of their preparation as teachers?
- To what extent can problem-based learning contribute to the development of 21st-century skills in a preservice Consumer Studies teacher-preparation program?

An exploratory mixed method research design was used to investigate the teaching-learning strategies used in a new preservice Consumer Studies teacher-preparation module as well as how students in this module perceived the strategies used to prepare them for their future teaching careers. The design was QAUL-quan, with the quantitative results supporting the broader qualitative findings.

The lecturer for the module as well as all students registered for this module in 2019 (n=5) contributed to the data. The students were viewed as the "others" in the action research, and therefore were not viewed as objects, but also had a voice, in line with the reciprocal relationship described by Kemmis (2009). All the students in the module were invited to complete an online pre-module survey in order to determine which types of learning strategies and 21st-century skills they expected to need to enable them to present effective Consumer Studies practical lessons. The initial survey used

rating scale (Likert type) questions, as well as open-ended questions to explore aspects such as students' prior experiences of problem-based or other teaching-learning strategies; their views on the importance of practical lessons; and which 21st-century skills they believed they would need to enable them to conduct practical lessons effectively as Consumer Studies teachers – before the commencement of their teacher training program.

Several traditional teaching-learning strategies were then used in the module, but a substantial part thereof was presented following the seven steps of the problem-based learning approach suggested by Schultz and Christensen (2004). At the conclusion of the module, the students were again invited to complete a post-module survey, also consisting of a combination of rating-scale and open-ended questions. The purpose of this second survey was to collect data about what the preservice teachers believed they had learned, which 21st-century skills they believed they had developed in the module, as well as their perceptions of the usefulness of problem-based learning as a teaching-learning strategy to prepare preservice teachers for the real-world challenges they might encounter. Van Beek et al. (2014) support the use of student perceptions for data collection as it is relatively easy to obtain, provides an overview of perceptions from the class as a whole, as well as of several lessons with the same teacher. The students were also required to anonymously write reflective notes on their experiences of the learning content and - strategies used in the module.

The qualitative data were analysed iteratively and numerical data from the rating scales used in both surveys were analysed quantitatively: to support the reporting of the qualitative data and to enable graphic representation of the findings. Diverging stacked bar charts were used for these charts, as recommended by Heiberger and Robbins (2014) for the plotting of results from rating scales to compare attitudes from respondents. Issues related to

“21st-century skills” and “problem-based learning” were identified as a priori codes before the analysis. In addition, a posteriori codes that emerged from the data – for example, entrepreneurship, apprehension about the future, and inclusivity of learners, were used. The codes were refined and categorized to enable differentiating of patterns from the combined sets of data. To support trustworthiness, a variety of sources, instruments and methods for collecting data were used; member checking was employed to review the accuracy of the report; and detailed notes were made during observations. In addition, the data from the different collection strategies were triangulated to contribute to the credibility, dependability and confirmability of the research. All ethical requirements stipulated by the ethics committee of the Faculty of Education were adhered to.

Findings and discussion

The findings are presented and discussed under four main themes, namely: the value that preservice students attribute to Consumer Studies practical lessons; their experiences of problem-based learning as a strategy to prepare them for such practical lessons; their preparation with and development of 21st-century skills; and the extent to which this approach contributed to bridging the gap between traditional preservice teacher preparation and real-world practical classrooms.

The value of practical lessons

None of the students in the module had any formal prior preparation for teaching practical lessons in Consumer Studies. Nonetheless, all the students believed that practical lessons were an essential part of the Consumer Studies curriculum and were indispensable for learners’ development in the subject, indicating that these students understood the value and importance of practical lessons in the subject. This is contrary to findings from a study

that explored South African Consumer Studies teachers' implementation of the subject (Du Toit, 2018) which showed that practical lessons are not always valued by all teachers and that several problems (such as lack of money or physical resources) hinder the realisation of this valuable learning in practice. Students' comments in the survey to motivate why they valued practical lessons include references to the contribution of practical lessons to learners' entrepreneurship education, application of theoretical learning in real-world situations and providing opportunities for including all learners in such learning experiences (inclusivity). The following comment by one of the students summarises these sentiments succinctly:

Practicals provide learners with a structured environment in which to build skills and help empower learners with real-life life skills which they can turn into a career. With South Africa's rates of unemployed youth these skills will be valuable for all children and young people....

Therefore, it is hoped that even if these students encounter difficult circumstances in their classes one day, they will persevere with presenting effective practical lessons because they believe in the value such learning holds for their learners. Holding the value of practical lessons in high regard would, however, not be helpful if teachers are not trained in ways that will support effective practical lessons. Hence, the findings on the planning and implementation of problem-based learning as well as how students in the module experienced it, are described and discussed next.

Problem-Based Learning to prepare preservice teachers for practical lessons

In preparation for the module, the lecturer explored available literature to identify a set of problem-based learning steps that would contribute most to the particular preparation requirements of Consumer Studies teachers, to

attempt to meet the action research requirement of practice-changing practice (Kemmis, 2009). That search resulted in the seven-step problem-based learning process described by Schultz and Christensen (2004) being selected for implementation in the teacher preparation module.

It was complicated to select the core problem upon which the problem-based learning in the module would be based. All the students in the module were Caucasian and were accustomed to schools that were highly functional, well-resourced and -managed and funded to support optimal learning. The students therefore had only experienced Consumer Studies practical classrooms that were operated in a similar functional, well-funded manner. Although there are still some well-managed and functional Consumer Studies practical classrooms across South Africa, the reality is that there are many schools where this is not the case. Consumer Studies practical classes are impeded by challenges such as a lack of resources, insufficient funds, crowded classrooms and poor management (Du Toit, 2018; Ngwenya & Shange, 2019), to name but a few. Classroom management is intricately linked to and interwoven with the learning taking place in that environment (Wolff et al., 2015) and is therefore imperative, especially when problems develop or emerge during a lesson. Preservice teachers have to develop practical knowledge and several skills to support effective classroom management and meaningful learning for learners (Wolff et al., 2015).

Uncertainties surrounding teacher placements in permanent departmental posts in South Africa mean that the students could end up teaching in schools very different from those they are accustomed to. Preservice teachers often have inadequate experience of real-world classrooms, which result in them being ill-equipped for problematic classroom situations (Koehler et al., 2019; Wolff et al., 2015). The module, therefore, had to prepare these preservice

teachers to be successful in well-appointed and under-resourced practical classrooms.

As all the students had experience of well-appointed practical classrooms, a decision was made to rather scaffold the problem-based learning in the module around a school where the Consumer Studies practical classroom was under-resourced so as to afford these students additional opportunities for authentic, action-based learning. This decision was based on the recommendation of Savery (2015) that activities used in problem-based learning should also be valued in the real world. To make the process more authentic and to support learning based on real experiences, photographs from a real-world Consumer Studies practical classroom together with a voice recording of an interview with the teacher served as the “problem” around which the learning in the module was scaffolded. The names of the school and teacher were kept confidential, but the photographs and interview were used with permission of the teacher, school principal and provincial Education Department, in keeping with the requirements of the ethics committee of the faculty in which the research was conducted.

Schultz and Christensen’s (2004) seven steps for problem-based learning were followed in the module to facilitate the students’ structured analysis of the problem and investigations into potential ways to address it. An additional eighth step – implementing the suggestions to address the challenges – was added in the module to contribute to the authenticity of the learning experience. In addition, this step allowed students to actively give back something to the community – even if only in a small way – by supporting the development of the practical classroom at the school that was utilised as the core of the investigation, which would, in turn, add value to the learning of learners in that classroom. This was in keeping with suggestions by Bouw et al. (2019) that learning and preparation for work

should be linked to allow active learning opportunities for practical problem-solving which will provide not only theoretical insights but also provide feedback to students once the suggestions for addressing the problem have been implemented (Wood & Nahmias, 2005).

A set of rating-scale questions in the post-module survey asked students to comment on the levels of usefulness they attributed to each of Schultz and Christensen's (2004) seven steps for the problem-based learning strategy as well as the additional eighth step (Figure 1). A four-level scale (-1=not useful at all; 1=useful; 2=advantageous; and 3=extremely useful) was used in an effort to dissuade neutral answers. The students experienced the clarification of the context or setting (step 1) as the least useful part of the problem-based learning strategy. Observations made during that phase of the process indicated that the students would have liked to see the setting (the classroom being analysed) for themselves rather than from photographs or through the eyes of the teacher. The students' request is in line with the statement of Koehler et al. (2019), that students should be enabled to navigate the context of the problem, and that the facilitator should provide support in this regard.

Step 5 – in which students had to formulate their own learning goals – was perceived as second-least useful (Figure 1).

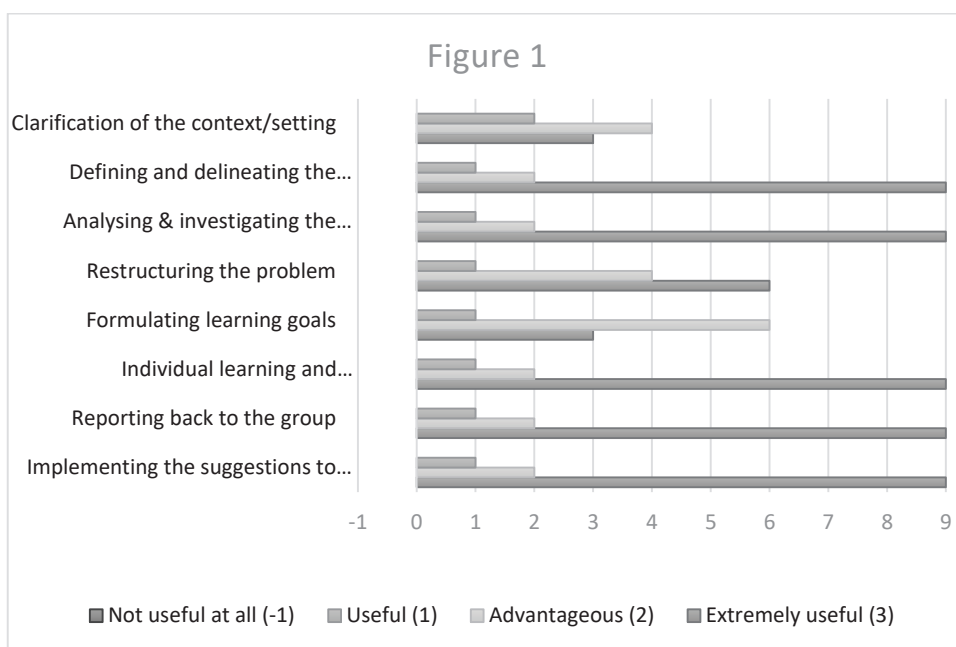


Figure 1: Students' perceptions of the usefulness of the different steps of the Problem-Based Learning strategy

The restructuring of the problem (step 4) was considered to be third-least useful; however, the lecturer noted enthusiastic participation and interesting insights from students during that phase. One explanation for the students perceiving these particular three steps as less useful than the others, is that they had not been taught using a problem-based learning approach before, which is a common challenge in higher education, as reported by McGlynn-Stewart (2010). The students were, therefore, unaccustomed to the value that each of these steps contributes to the learning process.

Another observation made during the restructuring of the problem-step was that the students had some warped expectations of how school teachers actually operate in the real world, that is, within the formal school curriculum and Departmental structures in South Africa. Triangulating data from the students' reflections confirmed the same sentiment when one student noted

that, “*you find that there are really schools where things isn't perfect which is scary*”, and another stated that, “*I thought the practical lessons would be easier and less complicated [than Consumer Studies theory lessons]*”. These comments confirmed that utilizing an authentic and problem-based learning strategy would help to better prepare these students for the real-world challenges they might encounter.

All other steps of the problem-based learning strategy employed in the module, including the eighth implementation of the suggestions step, were experienced by the students as equally useful and more useful than the previously mentioned three steps (steps 1, 4 and 5). Overall, these students experienced most of the steps in problem-based learning as advantageous or even extremely useful, reflecting the positive contribution of that learning to their development as preservice teachers.

Nonetheless, when students were asked to comment on how useful they found the different teaching strategies in the teacher preparation module (Figure 2), micro-lesson preparation and presentation (rather than problem-based learning) were deemed most useful. The same four-level scale (-1=not useful at all; 1=useful; 2=advantageous and 3=extremely useful) was used for this question. Facilitated contact sessions were regarded as second-most useful. The problem-based learning process, formal assignments and informal class discussions with peers were all viewed as equally useful but less so than the two strategies mentioned already.

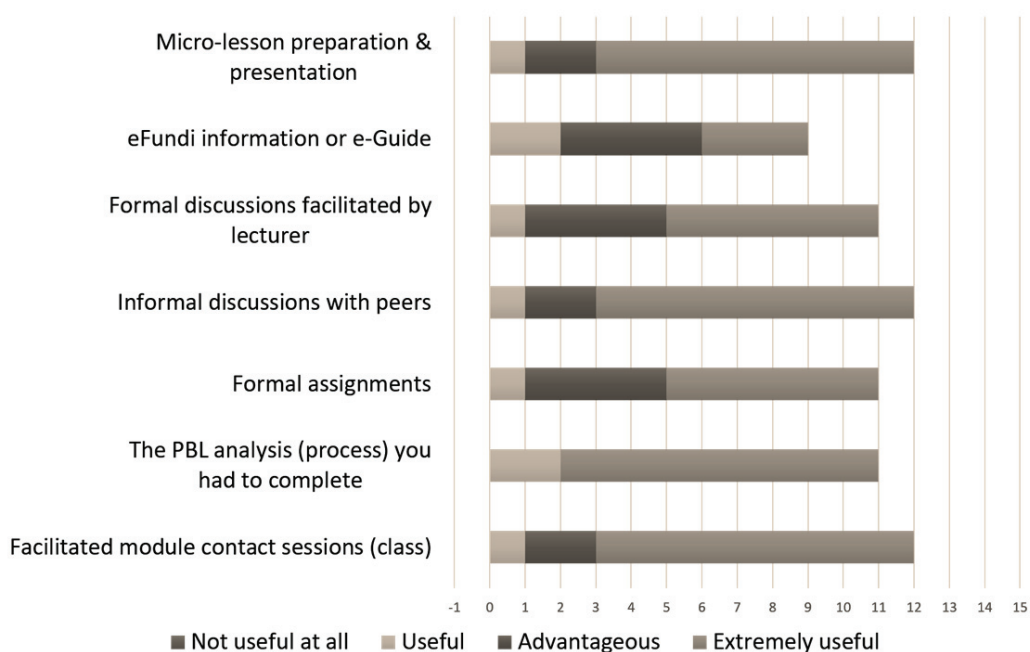


Figure 2: Students’ perceptions of the usefulness of strategies used for teacher preparation

This set of findings (Figure 2) indicates that students revert to what they know and feel comfortable with, that is: the structured and familiar strategies of micro-lessons and facilitated contact (face-to-face class) sessions. This finding is similar to that of Shinde (2014, p. 157), who stated that this type of traditional teaching is a “learning culture that the students are accustomed to”. It would take more than adapting part of a single module to problem-based learning to convince the students of the strategy’s value.

Lastly, it was interesting to discover that students considered eFundi (the University’s online learning platform) and the module’s e-Guide (a digital study guide including module outcomes, resources, activities and scaffolded assessments) as least useful (Figure 2). Previous students were quite reliant on this resource and the autonomy it gave them to learn on their own. Notes from classroom observations as well as comments made by the students in

their reflections indicated that the current group believed that the classroom discussions were the most useful source of information and the strategy they enjoyed the most. For example, one student articulated: “I LOVED it when we sometimes veered off topic and also talked about other important things...” A follow-up inquiry clarified these “other important things” as issues or interesting elements that the students might come across in their teaching careers one day.

So, even though students did not find problem-based learning as useful as some of the other strategies employed, they believed that most of the steps in problem-based learning contributed advantageous or even extremely useful learning to their preparation as teachers. It also provided them with insights into how the real world of teaching functions.

The question still remains: To what extent can problem-based learning contribute to the development 21st-century skills in a preservice Consumer Studies teacher preparation program? The next section attempts to provide some answers to this question.

The importance of and development of 21st-century skills

Numerous studies report that Consumer Studies teachers need several 21st-century skills to effectively facilitate practical lessons (Inn, 2017; Ngwenya & Shange, 2019; Umalusi, 2014). Thus, before commencing with the module, the students were surveyed on the importance of 21st-century skills that are required to enable Consumer Studies teachers to effectively facilitate practical lessons. The set of 21st-century skills described by Hixson et al. (2012) and listed in the conceptual-theoretical framework section of this article, was used in the pre-module survey (Figure 3). All students regarded skills needed for communication, creative and critical thinking, organization,

planning, problem-solving and time management as essential for preparing teachers for Consumer Studies practical lessons (Figure 3), even before they had any training for such lessons.

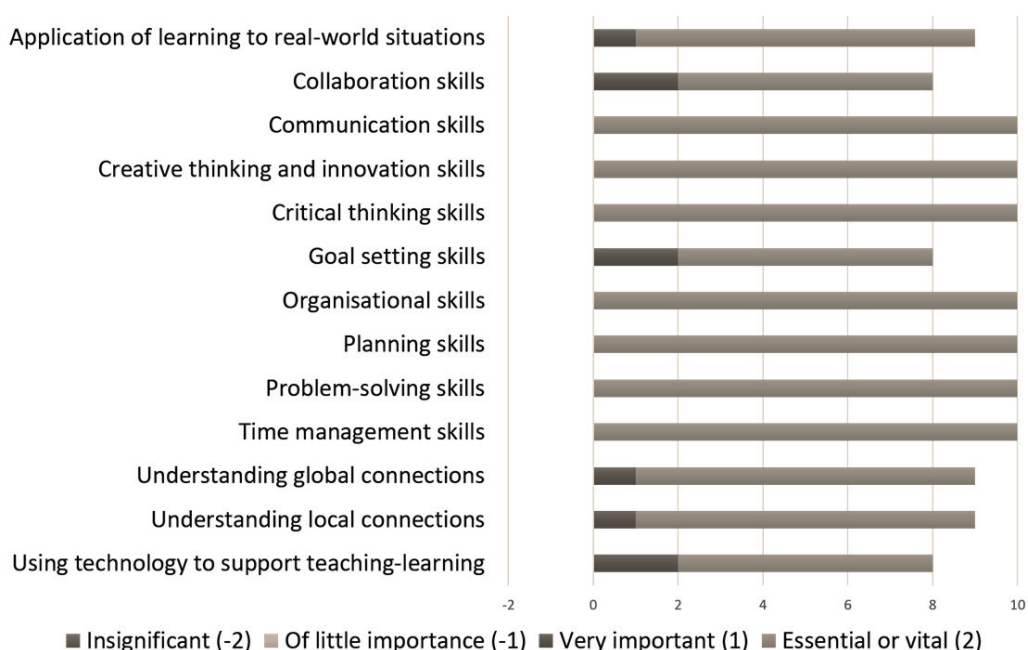


Figure 3: 21st-century skills that students believe a Consumer Studies teacher would need to facilitate effective practical lessons

At the start of the module, most students viewed collaboration skills, goal-setting skills and using technology to support teaching-learning as less important than the other 21st-century skills mentioned (Figure 3). Their lower regard for the importance of the skills needed for using technology in teaching and learning might have been based on their initial belief that fewer teaching technologies are used during practical lessons than in theory lessons. None of the students viewed any of the 21st-century skills as having little importance or as being insignificant.

Subsequent to their introduction to this set of 21st-century skills in the pre-module survey, each skill was briefly explained to them during one of the module contact sessions; therefore, they would have had a better understanding of each concept at the end of the module, when the post-module survey was completed. At the conclusion of the module, students were asked to indicate to what extent they believed their 21st-century skills were developed or improved as a result of the strategies used and resultant learning in the module (Figure 4).

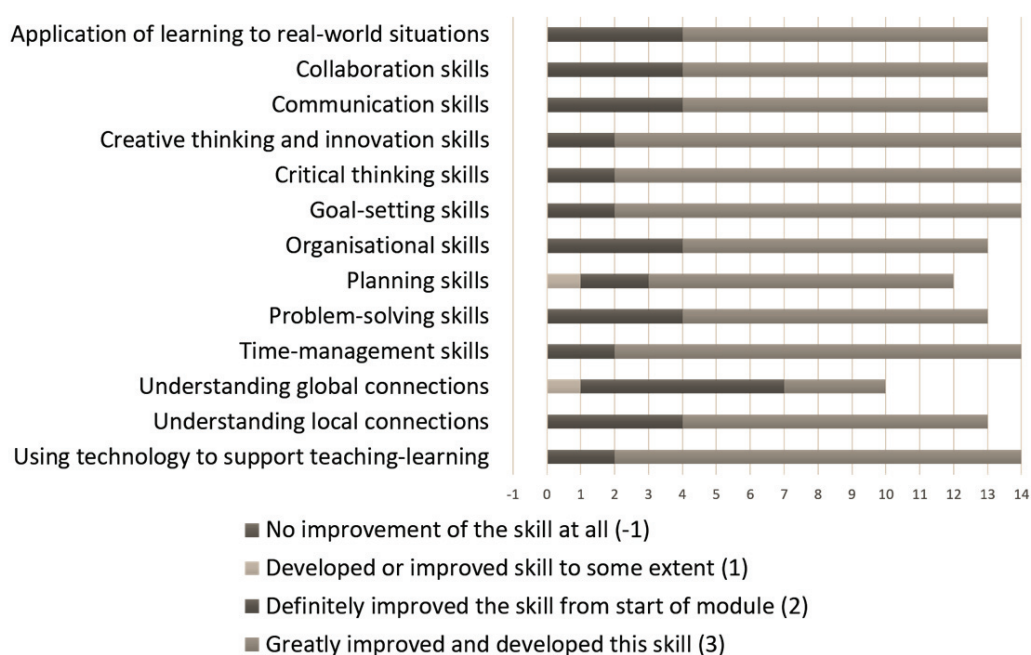


Figure 4: Students' perceptions of the improvement of their 21st-century skills after the module

The findings indicated that the students believed they had developed or improved most in their creative and critical thinking skills, goal setting and time management skills as well as the skill of using technology to support teaching and learning (Figure 4). Time management as well as creative and critical thinking skills were all viewed as essential skills that Consumer Studies

teachers should have before the students start the module (Figure 3) and, therefore, the finding that students believed these skills were greatly improved or developed in the module (Figure 4) was seen as especially positive.

As students initially indicated that the skills needed for using technology to support teaching-learning were less important than the other 21st-century skills (Figure 3), it was surprising to find that they believed this to be one of the skills they had developed the most (Figure 4). This discovery might be explained by the fact that one particular section of the module was devoted to using technologies in teaching and learning of practical lessons. The lecturer observed that the students thoroughly enjoyed that section, which introduced interesting and new technologies used particularly in practical production.

Despite the graph indicating that the students did not believe their collaboration skills improved as much as some other 21st-century skills (Figure 4), clear evidence thereof emerged from triangulation of the survey results, together with qualitative data from students' reflections and the lecturer's observations during contact sessions. For example, when asked to reflect on the single aspect of the module they found most useful, Participant 3 said, "I would say that the contact sessions was the best because we got to talk to each other and share our thoughts and experiences." Another question required students to comment on the part of the problem-based learning approach which they thought contributed most to their learning process. It elicited the following responses from three other participants:

"The discussions within the module with peers. Sharing of ideas and gaining different perspectives to the same problem help me prioritise my tasks and to help narrow down the choices"
(Participant 5);

“Report back to the group because then you’ll get good feedback from someone else’s perspective” (Participant 4); and

“Reporting back to the group and the analyzing, because with the analyzing you get to see everything ... you get to see the problems and solutions through others’ perspectives which is also nice because it is things you didn’t thought [sic] of but can also be helpful!” (Participant 2)

These responses and the notes the lecturer made during classroom observations point toward the co-construction of new knowledge, or social constructivism, and that it contributed to the learning experience in a positive way. Herrington et al. (2007, p. 2) describe such co-construction of knowledge to solve a problem as “true collaboration” and McGlynn-Stewart (2010) repeatedly underscores the importance of collaboration in developing and educating teachers.

It further emerged that students believed their skills to understand global connections were developed or improved the least (Figure 4). This was not too much of a concern, as global connections and interaction with teachers are not priorities for South African teachers, despite global interconnectedness increasingly becoming an issue that teachers must understand. However, and causing more concern, was the discovery, in second-lowest place, that students did not believe that their planning skills had improved much (Figure 4). One explanation could be that the students did not connect the various aspects of planning included in the module (such as lesson planning, practical organization, budgeting, or planning assessment) as contributing to their overall preparation to be able to plan Consumer Studies lessons. Consumer Studies teachers need to have well-developed planning skills which are needed for (amongst other elements) developing teaching plans, planning and managing time, infrastructure, equipment and finances in the subject (DBE, 2011). Planning lessons well, and achieving what was planned, will result in a more valuable learning

experience for learners (Inn, 2017). Negating the concerns about this finding slightly is the finding of a national investigation that the current Consumer Studies curriculum and associated documents for practical lessons are adequate to support and guide teachers in several aspects of planning in the subject (Umalusi, 2014).

From this section, it became clear that students were aware of the importance of 21st-century skills as part of their preparation as Consumer Studies teachers. Although the skills themselves were not measured, students believed that they did improve greatly in some of the 21st-century skills that were targeted to be developed in this module. If students' creative and critical thinking skills, together with the skill of using technology to support teaching and learning improved (as they believe), it will lead to interesting and innovative lessons. Combining the aforementioned skills with improved skills to set goals and manage time may well result in more effective learning experiences for the learners in these preservice teachers' classes in future. The positive constructivist learning that students experienced in the module may additionally inspire them to keep on collaborating and communicating with other teachers after their initial teacher training, thereby supporting lifelong learning.

The subsequent section addresses the contribution of the module to linking these preservice teachers' learning to the real world and preparing them for effective Consumer Studies practical lessons, in other words, if practice-changing practice took place in this action research study.

Bridging the gap to prepare students for the challenges of the real world

Finally, at the conclusion of the module, students were asked to reflect on how well they believed they were prepared for organizing, managing and

facilitating Consumer Studies practical lessons in comparison to before the commencement of the module. The aim was to explore if, and to what extent, the students believed that the overall learning in the module bridged the gap between their preparation and the real-world challenges they might face in their classrooms one day. In addition to students' written reflections, questions using a five-point Likert-type rating scale were used to collect the data, where 1=poorly prepared and 5=exceptionally well prepared (Figure 5).

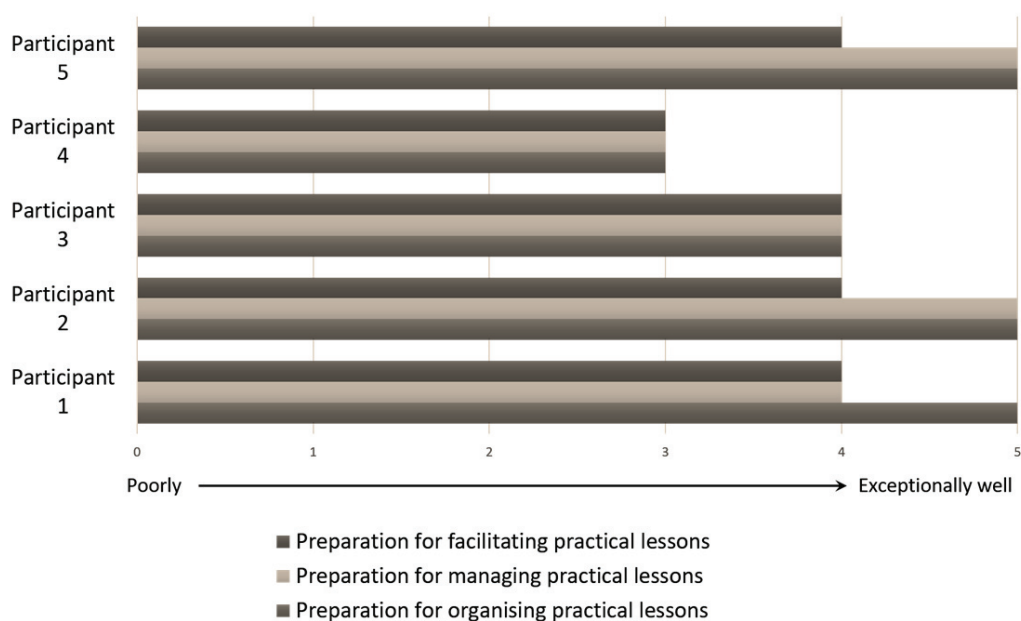


Figure 5: How well students believed they were prepared for Consumer Studies practical lessons

Participants 2 and 5 believed they were well prepared, but Participant 4 felt less prepared than the other students after the module (Figure 5). As all the students participated in all the activities and attended all contact sessions, such discrepancies in the perceived level of learning might be attributed to individual differences in levels of self-confidence or self-awareness which

develop as a result of the problem-solving and self-directed learning that is often fostered in problem-based learning (Shinde, 2014).

Figure 5 also shows that, in general, the students believed they were best prepared for organizing practical lessons but felt they were least prepared for facilitating practical lessons (Figure 5). This suggests that students still felt less prepared for actually facilitating or implementing practical lessons than for organizing or planning (also see Figure 4) the lessons. Besides one or two occasions during the work-integrated learning part of their teaching qualification, the students had few opportunities to present an actual real-life lesson, explaining their ambiguous feelings about conducting practical lessons. According to Inn (2017), newly qualified Consumer Studies teachers often lack confidence in their own ability to independently conduct practical lessons, underscoring the value of problem-based learning to help develop students' self-confidence. Consequently, it would be wise of module developers to not only focus on teaching-learning strategies but to also keep in mind the development of individual students and their particular needs, as well as students' experience of the learning process (McGlynn-Stewart, 2010).

Lastly, Wolff et al. (2015, p. 83) note that developing inexperienced preservice teachers' skills for effective classroom management, based on real-world scenarios, may foster these students' recognition and understanding of "the fundamental link between effective management and effective learning", which will be to the advantage of the learners in their classes someday and toward which this university will continue to strive in their teacher education programs.

Conclusions and recommendations

This study confirmed that problem-based learning can contribute to the development of 21st-century skills that Consumer Studies teachers will need to facilitate effective practical lessons. The strategy was valued by students for its constructivist learning and served to bridge the gap between their preservice teacher preparation and the challenges they might face in real-world practical classrooms in South Africa. Although students did not believe that problem-based learning was more useful than other teaching-learning strategies used in the module, they experienced most of the steps in the process as extremely useful. Linking the teacher preparation to a real-world problem through action research was a novel approach that afforded the students opportunities to positively collaborate and expand their views on real-world teaching.

In future, problem-based learning will continue to be implemented in this Consumer Studies teacher-preparation module based on the effectiveness thereof demonstrated in this study. However, it is recommended that a few adaptations be made to potentially improve its effectiveness in contributing to the learning of future students. Firstly, it will be useful to analyse students' individual learning needs before commencing with the module, as this will contribute insights into particular needs (for example, low self-confidence) that students have and the lecturer can attend to (if possible) in the module. Secondly, it is recommended that students are reminded of the interconnectedness of the various aspects that they are taught in the module. Such an overview could, for example, show how lesson planning, time management, stock-taking and budgeting are all linked to the skill of planning so as to give them insight into the bigger picture in support of their understanding of their preparation program.

Despite careful planning, there will always be some limitations associated with one's research. A small number of students participated in the study, and the findings are not generalizable. A formal tool to test students' performance in each of the skills could be used in future investigations to more accurately measure if, and to what extent, those skills were developed. Also, students did not select negative statements in the rating scale questions of the surveys. In future, it should be explained more clearly to them that their opinions are valuable, whether those are positive or not, and equal numbers of positive and negative statements should be included in each scale.

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