

Service learning model development in Korean medical education

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Abstract: Many medical schools provide curricular or extra-curricular courses focused on service activities for social responsibility. Research on service learning varies from theory to teaching model, but research on service learning in medical education is difficult to find. Therefore, this study's aim was to develop a model that combines a medical education curriculum with service activities in Korea. A design based research method was used to develop a service learning model in medical education in Korea by; analysing problems in educational settings (2014-2017), reviewing literature, and going through a total of three formative cycles. As a result of applying the first Service Learning Model in Korea Medical Education (K-SL-ME), which was developed through a literature review, to the school setting in three cycles and revising it, we developed a final Service Learning Model in Korea Medical Education, with stages of preparation, orientation, implementation, reflection, celebration, and evaluation. Analysis of students' results over the three years showed that the feelings of reward, interest, and satisfaction levels increased progressively. In particular, the students showed a stronger sense of reward, interest and satisfaction in the final K-SL-ME model applied in 2017 than in the first K-SL-ME model applied in 2014. This study is significant in that it outlines the concepts, need for, and teaching model of service learning necessary for the delivery of service-related programmes in medical education in Korea

Keywords: service learning model; Korea medical education; community service; community volunteer

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Introduction

Medical education and service learning in Korea

The medical curriculum in Korea consists of 6 years and emphasizes harmony and integration of basic medicine, clinical medicine, and medical humanities education programmes. The medical humanities education programme should, therefore, be integrated and linked throughout the whole programme. Among the five competencies required of a doctor set out in 'The Future Roles of Korean Doctors' published by the Korea Medical Association in 2014, communication and cooperation, and social responsibility are associated with the ability to understand, respond, and contribute to the needs of society. (Ahn, 2014), which emphasises the duty of medical education to cultivate medical personnel with such skills. (Kim, Kim, & Kang, 2015). Many medical schools, therefore, provide a formal or informal curriculum that focuses on service activities. A review of the homepage of all 40 medical schools in Korea, revealed that 11 medical schools are implementing service learning as a curriculum for their lower grades (pre-medicine) curriculum (search on October 7, 2020). The medical curriculum in Korea consists of two years of pre-medicine and four years of medicine. Pre-medicine aims to cultivate the basic qualities that a doctor must have before entering medicine, so many medical schools are mainly trying to cultivate humanism in the Premedicine years.

Not only medical schools, but also higher educational institutions offer courses on service activities based on local community needs and social responsibility. In Korea, service activities was introduced as a regular course by some universities from 1995 and according to a 2001 study, about 40% of 192 four-year universities nationwide have courses related to service activities (Lee, Kang, Jung, Lee, Min, & Yang, 2001).

Furco(Furco, 2003) said that community service, community volunteer learning, community-based learning, and service-learning internship are used as interchangeable terms with service learning, making it more difficult to grasp the meaning of service learning. Service learning may differ slightly in terms of emphasis and programmatic differences, but it is generally agreed that the intention of service learning is to provide students with both experience and learning opportunities.

Recognized as an activity of social, economic, cultural, and educational importance in many countries around the world, service learning takes

various forms (Won, 2003). In the United States of America, where service learning has been established as a regular educational programme, it has been introduced in various degree programmes, and its educational value and effects on cultivating social responsibility have been empirically proved through multifaceted research (Bilig, 2000). Student outcomes of service learning in medical education are reported as 1) academic learning and professional development, 2) personal development 3) enhanced citizenship and social responsibility (Stewart, & Wubbena, 2014).

The study of Park (Park, 2014), which analysed the trends in Korean studies on service learning, presents the following conclusions. Topics on service learning in Korean studies can be mainly divided into the theoretical exploration of service learning, analysis of the effects of service learning, development of teaching-learning models for service learning, and surveys on the status and awareness of service learning. First, theoretically, service learning is a combination of service and learning. Previous studies come to similar findings regarding reflection and reciprocity, which are components of service learning, while there are different views regarding the structure, curricula and the degree of linkage of service learning. Second, the effects of service learning are observed in various areas such as personal growth, intellectual development and learning, and social growth. Third, the development of teaching-learning models for service learning has been mainly conducted in secondary education settings, following three stages: preparation, implementation, and evaluation and reflection. Fourth, according to domestic surveys on the status and awareness of service learning, participants show high levels of satisfaction with service learning and are willing to continue participating in it, but there have been reported problems in the implementation stage in terms of connection with local community, systems, and the lack of support from schools and related institutions.

A study of trends in research on service learning in medical education from 1998 to 2012 analysed 63 papers (Stewart, & Wubbena, 2015). According to the findings of this study, only two studies were conducted in Korea on service learning in medical education: the studies conducted by Kim et al (Kim et al. 2008) and Kim et al (Kim, Kim, & Kang, 2015) which analyzed students' satisfaction levels with the curricula of service learning programmes. No research has been carried out for the development of service learning programmes. This study, therefore, aimed to develop a programme that combines a medical educational curriculum and service activities in Korea.

Design-based research

Design-based research (DBR), which is frequently used in research in educational technology, teaching design, and recent learning environment design, was adopted. DBR is a type of research mythology which was developed based on a reflective analysis of cases where there are numerous research results on educational programme design or model development; but they cannot be properly used in actual educational settings. One of its advantages is that it can ensure effectiveness in a real situation, not a controlled one (Lim, 2012; Brown, 1992; Bannan-Ritland, 2003; Collins, Joseph, & Bielaczyc, 2004; Joseph, 2004; Wang, & Hannafin, 2005; Richey, & Klein, 2009; Kang, & Lee, 2011).

As DBR is an activity to complete a practical educational theory or model by repeatedly implementing and evaluating prescriptive designs to solve realistic problems in collaboration with researchers and field experts in educational settings (Kang, & Lee, 2009), a design is tested or evaluated in an authentic learning environment (Dolmans & Tigelaar, 2012). It is also an approach suitable for medical education, enabling educational experts and medical schools to conduct research together. Although DBR involves iterative cycles, as in a formative study that is mainly used to improve a model, it can provide an intervention that can be used in educational settings, since it goes through an iterative design process to reflect the needs and expectations of the educational field (Brown, 1992). Whilst there is no established research methodological process for DBR (Lee, 2013), final models are developed after progressing through iterative cycles of working with practitioners in solving problems in the field, designing a model by analysing previous studies, and applying the initial model to actual educational settings (Bannan-Ritland, 2003; Joseph, 2004; Kang, & Lee, 2011; Kang, & Lee, 2009).

Service learning is based on Dewey's empiricism theory, and according to the characteristics of student reflection, social accountability, and community (Giles, & Eyler, 1994; Won, 2003), this study developed a service learning model suitable for the context of Korean medical education.

Methodology

For this study, in order to systematically develop a service-learning model in Korea medical education, a university which has a formal curriculum for service learning was selected. This university has courses related to service learning in the second year of pre medicine . Student evaluation is mainly carried out in three ways: First, the staff in charge of the service organization evaluates the degree of participation, cooperation, and enthusiasm, and second, the student self-evaluates the degree of readiness, cooperation, and participation. The integrity of the writing was also assessed. However, in this study, because a model was developed by applying it to the actual field, integrity was excluded because the difference in student assessment results by year could not be confirmed. Only reflections were analysed to confirm the learning achieved by the student.

To develop a service learning model in Korean medical education, (hereinafter the 'K-SL-ME model') this study used DBR as a research method by; analysing problems in educational settings, reviewing literature, and going through a total of three formative cycles (Figure 1) First, the need to apply learning to service was identified through interviews with educational practitioners, and also that service learning programs should not only provide service activities. To address this need, the study developed the first K-SL-ME model applicable to medical education settings by reflecting on the theoretical origin, definition, characteristics, and process of service learning through a literature review. The first K-SL-ME model was implemented in 2014 for 76 second-year pre-medical students at a medical school. This was the first formative cycle. The implications of that formative cycle were derived from the reflective journals and satisfaction levels of the participating students, based on which the second K-SL-ME model was developed. The reflective journals recorded the contents of service learning, the points learned, deficiencies, and improvements achieved after the service learning period.. Significant words from the reflective journal were extracted, categorized, and used to improve the next cycle.

For ethical reasons, at the beginning of the reflective journals and questionnaires, students noted that they had voluntarily participated in this study and gave their informed consent to the use of these documents..

The second K-SL-ME model was conducted for 77 second-year pre-medical students in 2015, As in the first cycle, the implications of the second formative cycle were derived from the students' reflective journals

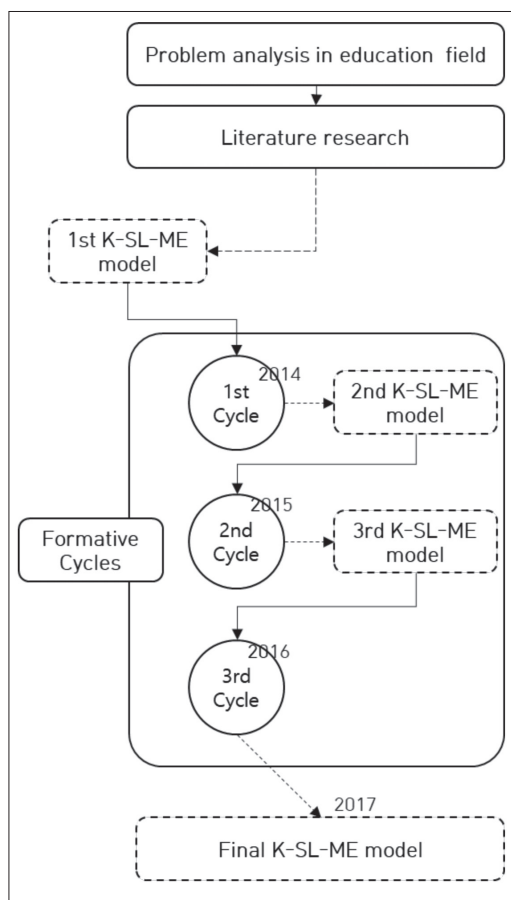


Figure 1:
Research procedure

and satisfaction levels. Based on these data, the third K-SL-ME model was developed.

The third K-SL-ME model was implemented in 2016 with 15 educational personnel at social welfare organizations and 64 second-year pre-medical students for the third formative cycle. Again, the implications of the third formative cycle were derived from the students' reflective journals and satisfaction levels, and also from focus group interviews with the educational staff at the organizations. Based on these findings the final K-SL-ME model was developed. This final K-SL-ME model was carried out in 2017 for 79 second-year pre-medical students at the medical school,

and their satisfaction level was surveyed to determine the effectiveness of the model. To analyze the students' satisfaction levels with the models implemented every year, descriptive statistics and analysis of variance were conducted using the IBM SPSS 26.

Results

Development of the First K-SL-ME Model

The service activity program investigated by this study was run for medical students with approximately 4 hours allocated to each semester. At that time, a Memorandum of Understanding (MOU) was signed with the local welfare centres association. The directors of the local welfare centres communicated their need for service work from medical students to the professor in charge who would assign at least 2 to 5 students to each welfare centre. The students would then undertake the service work required and submit activity journals at the end of the service period. The researchers conducted a literature analysis on the basis that educational intervention was necessary for this programme, in order to provide substantial learning opportunities through the service activities, rather than simply being a service programme.

There is no single concept of service learning as it is defined in various ways by scholars (McElhaney, 1998). Theoretically, service learning originated from John Dewey's empirical theory of education, but it was not until the late 1970s that the term 'service learning' was coined (Kim, Kim, & Kang, 2015). Service learning is a concept that combines service with learning and is characterized as an active learning activity to reflect and understand oneself, cultivate social responsibility, and be connected to the local community (Won, 2003). In this study, a model was developed based on Watkin and Braun's components of service learning (Watkins, & Braun, 2005), which are; service with learning experiences, reflection, and reciprocity, and which include these characteristics. First, service with learning experiences should be relevant to the local community, and should involve meaningful service, enhance learning, and provide learning as democratic citizens. Therefore, the researchers first identified the types of service activities experienced by students through the existing program and asked the social welfare organization personnel to exclude

simple administrative work from the activities. Second, reflection should involve a meaningful evaluation by providing feedback opportunities to those associated with the programme, including professors, students, and people who have benefited from the service. Therefore, in this study, a reflective journal was developed to help the participating students to write their thoughts about what they gained through these activities, along with an activity log. A celebration stage was added so that the participating students, professors and social welfare organization personnel could celebrate together after the service learning period. Third, reciprocity requires partnership between professors, students, and social welfare organizations in the teaching and learning process to provide the best service learning experiences. As the university and the social welfare organizations had already signed an MOU before the beginning of the study, both were reminded of their partnership once again, and the professor in charge of the programme decided to visit the social welfare organizations for the implementation of the program.

The stages of service learning vary as shown in Table 1. However, this study applied the four stages of preparation, implementation, evaluation/reflection, and recognition with celebration as developed by Fertman (Fertman, White, & White, 1996), and included all these stages (Park, 2014) (Figure 2). This is similar to the four steps of planning and preparation, action, reflection and demonstration, and evaluation and celebration, obtained through analysis of earlier studies on service learning in medical education (Stewart, & Wubbena, 2014).

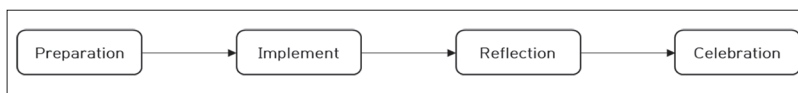


Figure 2:
1st K-SL-ME model

Each stage was structured as follows. In the preparation stage, orientation is conducted to inform the students of the purpose and significance of service learning. This orientation stage consists of two parts: the professor in charge of the program explains the benefits and importance of service learning, and the social welfare organization's educational representative gives a presentation on the need for service work and explains precautions needed regarding service learning activities. In the implementation stage,

the students carry out the service learning activities. In the reflection stage, the students record their own reflections on the service learning activities conducted in the implementation stage. In the celebration stage, poster exhibitions and awards ceremonies are held for sharing and encouraging service learning activities.

Table 1
Components of Service Learning

Dymond et al (2007)	K-12 Service Learning Planning Toolkit (2009)	Park (2014)	Fertman (1996)
Authentic Context	Investigation	Activity planning and preparation	Preparation
Link to the Curriculum			
Home, School, and Community Partnerships			
Programmatic Support			
Frequency of Instruction			
Planning and Preparation	Planning and preparation		
Action	Action	Action	Implement
Reflection	Reflection	Activity evaluation and celebration	Reflection
Celebration	Demonstration of results and celebration		Celebration
Student Assessment and Program Evaluation			
Student Participation and Ownership			
Teacher, Adult, and Community Participation			

First Formative Cycle

As a result of applying the first K-SL-ME model to the first formative cycle, the levels of interest in and feelings of reward from service learning were averaged at 4.5 (standard deviation 0.8), with an average satisfaction rating of 4.4 (standard deviation 0.7). The problems that emerged from these results and from the analysis of the students' reflective journals were as follows. First, as the contents of service activities varied by organisation, and included administrative work, student guidance, support for senior citizens and support for the disabled, there were differences in the activities experienced by students and the levels of their satisfaction. Second, the students tended to create better reflection journals when they were required to write immediately after each service learning activity rather than after the completion of all the service learning activities. Third, some social welfare organizations did not provide a detailed guide for the service activities, which caused the participating students to complain of difficulties in performing them. Based on these findings, the second K-SL-ME model was developed as shown in Figure 3. The first K-SL-ME model's preparation stage was changed to an orientation stage; the preparation stage was adapted so that the professor in charge of the program and the educational staff at the social welfare organizations met to share their opinions about the completed service learning program, comment on the students' opinions and make improvements. The orientation stage was structured in the same way as the first K-SL-ME model's preparation stage. The implementation and reflection stages were conducted at the same time, and the students were asked to submit their reflection journals within a week of the service learning activities. The celebration stage was structured in the same way as in the first K-SL-ME model.

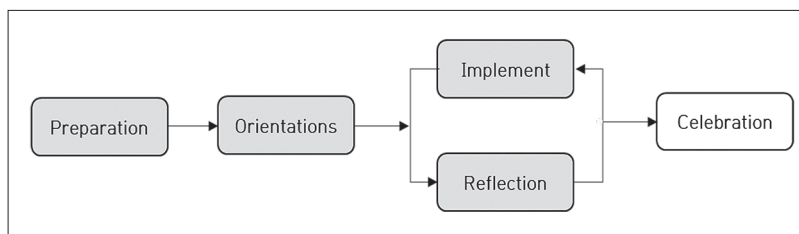


Figure 3:
2nd K-SL-ME model

Second Formative Cycle

Applying the second K-SL-ME model to the second formative cycle, the levels of interest in and feelings of reward from service learning were averaged at 4.6 (standard deviation 0.7), with an average satisfaction rating of 4.6 (standard deviation 0.8). The problems which emerged from these results and the analysis of the students' reflective journals were as follows. First it turned out that the educational personnel at the social welfare organizations would be changed every two years or on a regular basis. Second, there were still cases where some organizations required students to do administrative work. Based on these findings, the third K-SL-ME model was developed as shown in Figure 4. While the preparation, orientation, implementation and reflection, and celebration stages remained the same as in the second K-SL-ME model, an evaluation stage was added at the end of the process. The evaluation stage was intended to enable the professor in charge and the educational personnel at the social welfare organizations to jointly review the students' opinions on service activities and to share their opinions after the completion of the service period, in order to make improvements for future service learning. During the third formative cycle, the sharing of the kind of activities provided by each social welfare organization, as well as the students' satisfaction levels in the preparation and assessment stage was strengthened, to encourage organizations to voluntarily reduce the proportion of administrative work in service activities.

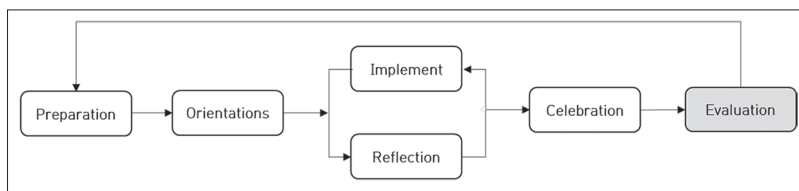


Figure 4:
3rd K-SL-ME model

Third Formative Cycle

As a result of applying the third K-SL-ME model to the third formative cycle, the levels of interest in and feelings of reward from service learning were averaged at 4.7 (standard deviation 0.6), and the average rating of satisfaction was 4.6 (standard deviation 0.8). The issues that emerged from the results and the analysis of the students' reflective journals were as follows. First, students and social welfare organizations were curious about the areas of service activity that students wanted. Second, it was difficult to intuitively determine the implementation timing of each stage of the K-SL-ME model. Based on these findings, the final K-SL-ME model was developed as shown in Figure 5.

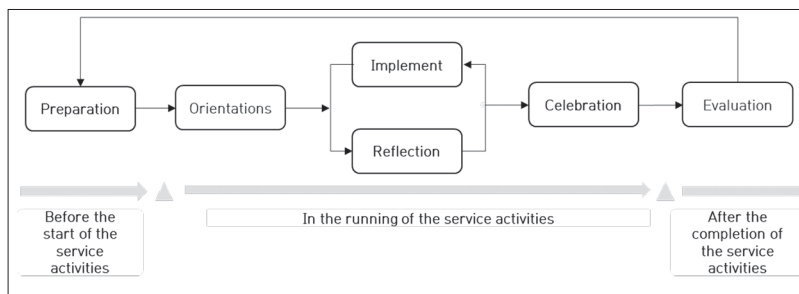


Figure 5:
Final K-SL-ME model

In the preparation stage, the professor in charge and the staff of the social welfare organization together considered the implications of the previous service learning programme and shared its achievements and significance. In the orientation stage, the professor explained these to students, and the social welfare organization staff gave a presentation on the purpose of service work and the care that needed to be taken in relation to such activities. In the implementation and reflection stages, students were asked to submit their reflection journals soon after conducting service activities. In the celebration stage, posters about service activities were produced and presented. In this celebratory event, the kinds of service activities and the students' thoughts and feelings about them were shared, and attendees voted to select award winners. In the evaluation stage, the professor in charge and the educational staff at the social welfare organizations shared the student's opinions and discussed necessary improvements.

Effectiveness of the K-SL-ME Model

Descriptive statistical analysis and analysis of variance were conducted to find out whether there was any difference in the students' sense of reward, interest, and satisfaction levels after the service learning activities, depending on the models applied according to the formative cycles (Table 2). The results of the analysis showed that the sense of reward, interest, and satisfaction levels of the students continually increased. As a result of statistical difference analysis, statistically significant differences were observed in the sense of reward and interest ($F=0.91$, $p<0.05$) and satisfaction levels ($F=2.76$, $p<0.05$) as the model was modified. As a result of a post-hoc test (Bonferroni) to determine the specific model, the students showed a greater sense of reward, interest and satisfaction in the final K-SL-ME model applied in 2017 than in the first K-SL-ME model applied in 2014.

Table 2:
Variation of Students' Worthwhile and Interests, Satisfactions by Applying K-SL-ME Model

Dependent variable	Item	N	Average	Standard deviation	F	p	Post hoc test
Worthwhile & Interest	2014	77	4.49	0.84	0.910	0.035	2017>2014
	2015	56	4.61	0.65			
	2016	64	4.73	0.57			
	2017	79	4.77	0.45			
	Satisfaction	2014	77	4.38			
2015	56	4.55	0.76				
2016	63	4.57	0.82				
2017	79	4.70	0.49				

This study analysed the reflection diaries completed by students to confirm that the service learning programme which applied the service learning model in Korea medical education achieved the expected learning outcomes. As a result, personal development and social responsibility were confirmed, in addition to the reward, interest, and satisfaction of service learning.

Students' feedback

Talking with the disabled and staying together, I learned what we had in common and how to communicate with them.. It was also fun to help others, communicate with the disabled people, and become friends with them. In the future, I will communicate with the disabled and live with the thought that there is no difference between us.

Personally, my personality seems to have become softer and I am interested in helping others.

I was very grateful that the school gave me, who had never before given service to others, the opportunity to do this kind of activity. Thanks to this, as I matured, my own perspective, which was only concerned with my own success, broadened, and became more appropriate.

It is reported that the service activities provided an opportunity to think about society's responsibility as a medical student and a future doctor.

I realized that my small amount of help could be a great deal of help to the other person. And it turns out that people we do not know need our attention and our small amount of help.

I came to know the joy of giving service, seeing myself as I have not seen before, and thinking of many things I have gained through it. I have become more humble and realise that what I can do is not because of my abilities, but because of my socioeconomic status.

Discussion

With the aim of developing a service learning model in Korea medical education, this study used DBR that can be used for model development. DBR is a highly practical approach as it involves model development conducted in real educational settings. It is thus a suitable approach for medical education model research, enabling joint model development by theoretical experts and practitioners who can apply the model to actual educational settings. Therefore, this study developed a service learning

model in Korea medical education through several formative cycles based on a literature review on the concepts, characteristics, and components of service learning. The study findings are as follows.

First, the social welfare organizations participated only in the preparation stage in the first K-SL-ME model, explaining the service activities to the students. However, throughout the first two formative cycles, their role expanded from simply providing service activity opportunities to participating in the planning, implementation, and evaluation stages. The social welfare organizations are now expected to play a more active role in helping students to carry out service learning activities with a sense of ownership, by emphasizing social responsibility, one of the goals of service learning, rather than simply providing service learning activities.

Second, the model encouraged the professor in charge of planning service learning and the staff of the social welfare organizations which provide service learning activities, to have two meetings during the programme period. These are to share the outcomes of the planned service learning activities and to give feedback on the results, so that they can be incorporated in future programmes.

Third, the reflection and implementation stages were conducted at similar times so that the students could reflect on their service activities in a timely manner. The reflective activity was structured into a review of the service activities in detail, sharing thoughts and feelings about them, identifying necessary improvements, and looking ahead to the future.

Fourth, this model added a demonstration stage at the end of the process so that students could share their learning achievements by demonstrating and celebrating these achievements and sense of accomplishment, rather than participate in compulsory service activities as required by the school.

This study is significant in that it outlines the concepts, needs and teaching model of service learning necessary for the implementation of service-related programs in Korean medical education. However, this study has limitations as it was only conducted on students from one medical school and the students were in the pre-medical programme, so they had less exposure to medical science and practice. Service learning related programs are helpful for personal growth, intellectual development and learning, and social growth (Park, 2014), but since resources are invested in the design, delivery, and evaluation of such programs, school authorities need to design such a program systematically, rather than allowing one professor to take charge of the programme. It is suggested that any future research related to service learning in Korean medical education should

focus on topics such as the need for service learning to be related to learning achievements, service learning models according to learning achievements by each period, and ways to measure and evaluate student performance in service learning.

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