Development, Implementation and Evaluation of Curricula in Nursing and Midwifery Education

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ISBN 978-3-030-78180-4 ISBN 978-3-030-78181-1 (eBook)
https://doi.org/10.1007/978-3-030-78181-1

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Contents

Introduction

If there are changes in nursing care and midwifery, the education of nurses and midwives must change, too. Curricula form an important means of controlling the educational processes in schools and universities. When we designed the book, we expected that different approaches and instruments of curriculum development would be used in different countries. Our goal was to contrast and compare these approaches. We were able to attract scientists from different parts of the world who are involved in nursing and midwifery education. What we found is that the approaches our authors rely on do not greatly differ; on the contrary, the approaches are remarkably similar. We think this is the most interesting result of this book, and it is very instructive how curricular problems are resolved by colleagues in other countries. We can resume that the approaches presented in this book reflect the transnational state of the art of curriculum development in nursing and midwifery education.

The book is divided into four parts. In the first part, we merge articles that utilize results of empirical studies as starting points for curriculum development. The second part includes contributions that describe methods and principles of curriculum construction. Implementation and evaluation is subject of an article in the third part and some interesting examples of curricula are presented in the fourth part.

Empirically Based Development of Curricula

Empirical information is an important input for curriculum development. For example, the six-step-approach of Kern et al. (2006) starts with an identification of problems in health care, a general needs assessment and a targeted needs assessment of the learners. This is the starting point for the development of a module for the preconception period in a midwifery course. Polona Mivšek, Nuša Rogan and Petra Petročnik from the University of Ljubljana, Slovenia, found that there is a lack of preconception health care and conducted a study among midwifery students examining their knowledge of risk factors that threaten the ability to conceive. As explained in their article “From wish to family: stressing a preconception period in a curriculum as an important part of midwifery scope of practice”, the result of the study was the basis of the new curriculum.

The other three articles also use empirical research as a basis for curriculum development, but the focus of these authors is rather on work processes and work situations, and after ascertaining these by empirical studies they derive qualification requirements. In Germany, this approach, which follows an occupational-educational research perspective, is called qualification research. Georg Spöttl, Gert Loose (both from the University of Bremen, Germany) and Matthias Becker (Leibniz University Hannover, Germany) have developed a procedure for carrying out a work-process analysis in various curriculum development projects in Technical Vocational Education and Training, which they describe in their article "Detailed Curricula Based on Work-Processes—The Need for Updating the Conventional Approach for Developing Curricula in TVET". A work-process analysis consists of ten steps. These steps aim to identify advanced occupational standards and subsequently develop advanced detailed curricula. With this procedure, the authors want to ensure that the curriculum promotes the skills that are actually relevant to practice. Many of the steps suggested by Georg Spöttl and colleagues are used by Kordula Schneider, Heidi Kuckeland and Christoph Hamer from the University of Applied Sciences Münster, Germany, in preparation for a general nurse curriculum. They explain their methodical approach in the article "A Curriculum on the Basis of Qualification Research". In 2020, a new professional profile was established in Germany: the general nurse. Up until then, there had been three nursing professions, each specialized in a specific target group: sick children and young people, elderly people in (inpatient) long-term care and sick people in acute care. The authors wanted to find out which work processes could be generalized for all target groups and all care areas and which are specific for a special target group of one of the former nurse professions and must also be integrated into the new curriculum. They reached 38 core work tasks, for example, "provide specialist advice", "perform wound management" or "help with personal hygiene" and four principles of nursing. Most central core work tasks are "shape nursing according to processes" and "act in a relationship-oriented way". Each core work task is described by categories of reasons for nursing and examples for challenges and unprofessional behaviour. Based on the core work tasks found, learning situations were constructed.

Promotion of interprofessional competence should be anchored centrally in training curricula for midwives. Although medical care is only needed in special obstetric situations, for example, when complications are likely, in the clinical setting in Germany medical professionals take the lead in all obstetric care, even when there are no special demands. Since the reality of health care in Germany does not meet the requirements for equal cooperation between professions, it is not sufficient to identify core work processes as empirical input for curriculum development. For this reason, Monika Kraienhemke, Cologne, Germany, first aimed at identifying the structures and key problems which are characteristic for the current interprofessional working situation of midwives in the clinical setting as the starting point of curriculum development. In her article, "Key problems in interprofessional collaboration in midwifery as starting point of curriculum development", she expounds her research methods consisting of observations and episodic interviews and the results of her study. She noted that midwives follow quite different patterns of behaviour

corresponding with three part identities, namely "autonomous expert", "part of the obstetric team" and "medically oriented companion of the woman". Kraienhemke draws the conclusion that in midwifery education the development of competencies for interprofessional cooperation must first begin with the students becoming aware of their professional identity, in order to ensure that the students learn the principles of midwifery philosophy and care and bring these principles to work, even when they work in non-independent settings.

Methods and Principles of Curriculum Construction

In this section, the contributions focus on methodical approaches of curriculum development and on principles of curriculum construction. All contributions follow the backward design model by first defining the competencies and the benchmarks for each year of nursing training. In the other steps of curriculum development, content and learning strategies are selected which can foster the intended results. The authors use very similar curriculum construction principles like an orientation on situations and on competency building.

A competency-based curriculum is described by Claudine Murararaneza from the University of KwaZulu-Natal, South Africa. The curriculum reflects on a general change of education and learning on the one hand, and on an innovative health care system on the other hand. The process and product of this curriculum development is targeted to a paradigm shift: the construction of the competency-based curriculum which means that it is the base for a nursing education addressing societal needs. In order to generate the learning outcomes which are needed in the labour market, the method of curriculum construction uses the principle of participation. All main stakeholders are involved in the process of curriculum development to become informed and to achieve a shared decision-making. These principles and methods of curriculum construction are connected to institutional and instructional reforms: regarding the faculty a non-hierarchical relationship is purposed, for instruction a high engagement of students is intended.

The contribution of Tama Morris, Queens University of Charlotte, USA, also deals with a specific method of developing and constructing a curriculum. Following the backward design model according to Wiggins and McTighe's (2005) she uses three steps: Step one is dedicated to identifying the objectives and outcome of programme. Step two deals with evidence of the achievement of intended objectives; the focus is the observable and measurable competencies of students. In step three, the learning activities are designed for students to gain knowledge and experience. The instructional design is highly influenced by the constructivist theory. Backward design is a common method of curriculum design in nursing education and could be used for a programme design in general or for a single course design within a curriculum. This backward design is a method which could be most helpful in the process of transforming nursing education from a vocational to an academic level.

Sebastian Partsch, Sabine Muths and Ingrid Darmann-Finck, University of Bremen, Germany, developed a curriculum to promote communicative competence

in 3-year nursing vocational training in Germany. The curriculum is characterized by the fact that it is structured on the basis of real-life situations. Based on these pedagogically prepared case situations, the skills necessary to cope with these situations can be acquired. According to Benner's competence development model (1984), the case situations become more and more complex in the course of the 3-year training, which means that more and more influencing factors relevant to nursing communication must be taken into account. In addition, the requirements of the situation are expanded as increasingly complex social expectations and roles must be assumed. Some learning situations, the so-called key problem situations, also involve conflicting demands, feelings or norms. These situations require a critical reflection of the contradictions and particularly intend for the students to recognize power and disregard relationships. In the article "Communicative Competencies in Nursing: A situation- and competence-based curriculum", the authors illustrate the underlying curricular design principles of situation and competence orientation using the example "interacting bodily". In order to make the curriculum accessible to all schools, a freely accessible database was developed and implemented.

Implementation and Evaluation of Curricula

A curriculum forms an important means of control, but it can't determine the implementation by teachers. Beneficial factors for implementation include a promise of effectiveness, flexibility, high clarity, high quality of materials and a moderate complexity. In the article of Heidi Herinckx, now Oregon Center of Excellence for Assertive Community Treatment, Portland, Oregon, USA, and Christine A. Tanner and Paula Gubrud-Howe, both from Oregon Health & Science University, USA, "Evaluation of the Oregon Health Sciences Curriculum" not only is an extraordinarily complex approach of evaluation presented, but also some further aspects of implementation. For the evaluation of the Oregon Consortium Nursing Education (OCNE) Curriculum, an instrument was developed to measure the implementation rate of the curriculum, the OCNE teaching fidelity scale. In the context of evaluation, the scale was used to explore the correlation between the extent of implementation and the learning outcomes of nursing students. The use of such a scale can also enable the identification of deficits in the implementation and thus support the implementation process. The evaluation of the OCNE Curriculum considered different perspectives, the faculty experience, the outcomes on the side of the students (student satisfaction, number of Baccalaureate-qualified nurses, number of nurses with RN licensure, impact of clinical performance) and the employers' satisfaction. While the curriculum, for example, has a positive impact on teachers' experiences and the number of bachelors' prepared nurses in Oregon, there was no relationship between the extent of implementation and the learning outcomes of the students. Employers are highly satisfied with the quality of nurse graduates from OCNE programmes and non-OCNE schools alike. Further evaluation should explore why the outcomes are not entirely clear. At this time, the authors have drawn the conclusion to strengthen the implementation of the curriculum.

Interesting Examples

The last section highlights a variety of interesting, international examples of curricula.

Christine A. Tanner and Paula Gubrud-Howe, both from Oregon Health & Science University, USA, describe the "Development of the Oregon Health Sciences Curriculum—An Innovative, Competency Based Curriculum in the US". The aims of the project were to increase the proportion of nurses with a bachelor's degree in Oregon and to redesign nursing education to target more effectively the changing health care needs of Oregonians. A 35-member committee, consisting of representatives of all full partners of the consortium, developed the curriculum by reducing the content, strengthening the ability of students to use learning methods and integrating learning activities contextualized in clinical nursing practice. Initially, ten competencies were defined. Case-based learning, clinical learning experiences and manikin-based simulation were adopted in the curriculum to master the competencies. Subsequently, the curriculum is delivered on 16 community college and university campuses throughout the state of Oregon.

The World Health Organization (WHO) is promoting new models of primary health care as family health care. The European Union (EU) identified the family and community nurse, in particular, as a key player. As there was no common professional profile of this family and community nurse (FCN), a project was funded to design a suitable curriculum. Scientists and nursing programme constructors from six different European countries (Belgium, Finland, Germany, Greece, Italy, Portugal) worked together in order to identify a European professional profile for FCNs and to construct a European curriculum to become an FCN. This project was implemented in four steps. First of all, the existing requirements for FCN education were evaluated. In a second phase, a new professional profile was generated from the available FCN guidelines which cover the whole EU. The third part of the process was dedicated to designing an EU curriculum for FCN. In a fourth and final step, this general EU curriculum for FCN was adapted for the specific needs and circumstances of participating countries. This step not only led to national curricula, but also to piloting the different national programmes in order to initiate regular educational activities to qualify FCN. This chapter is written by members of the European project group (Francesca Pozzi, National Research Council, Institute for Educational Technology, Genoa, Italy, and colleagues); it impressively shows the complex but worthwhile method of curriculum construction on an international level.

Another European example with a global impact has been contributed by Norma Huss (University of Applied Sciences Esslingen/Germany) and her colleagues from the Netherlands, Spain and the UK. This example also derives from an EU project named NurSus. The aim of this project is to enhance the availability and relevance of a learning offer in Sustainability Literacy and Competency (SLC) in nurse education. For this purpose, NurSus developed innovative teaching and learning approaches and materials. Regarding the fact that there is a reciprocal relationship between the anthropogenic climate change with its consequences for the whole environment on the one hand, and health and well-being on the other hand, nurses

have a mission to deal with this problem. Nurses not only should address the ecological public health threats they also should be role models for sustainable health policy. The authors describe how the project group generated evidence-based competencies which are needed for nurses on expert assessments. Based on key sustainability competencies for nurses and framed by a Sustainability Literacy and Competency (SLC) framework, educational materials—the NurSusTOOLKIT—were developed and evaluated. This curriculum example also shows the prominent role of nurses in dealing with the global challenge of sustainability and the responsibility of nursing education to raise awareness for sustainability in training programmes.

Interprofessional collaboration is a key challenge regarding a high quality of care supply and the innovation capacity of the health care system. In order to reach this aim, Interprofessional Education (IPE) is regarded as useful and necessary preparation. IPE means that different professions—at least two of them—learn from, with and about each other. A special feature is that faculty and students from different departments or universities for health professionals are involved in curriculum development. Jill Thistlethwaite, University of Technology Sydney, Australia, presents an approach which is justified by definitions, based on theory, aligned by learning outcomes and shaped with appropriate learning activities and assessment procedures. For the construction of this IPE curriculum, a specific model was used, the 4D-framework. The four dimensions are the future health care needs (1), the corresponding competencies (2), the delivery of IPE through activities of teaching and learning (3) and the supported conditions of the institution (4).

This anthology assembles contributions about empirically informed curriculum development, methods and principles of curriculum construction, implementation and evaluation of curricula illustrated by three interesting examples. Each chapter shows another perspective and different approach to this subject. As the contributions are from all over the world, they also reflect national specifications, as well as the general mission of nursing and health care. Therefore, this anthology represents the variety of nursing and health care education, but at the same time the high relevance of the nursing and health care professions for global vitality.

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Part I

Empirically Based Development of Curricula

From Wish to Family: Stressing a Preconception Period in a Curriculum as an Important Part of Midwifery Scope of Practice

1

Polona Ana Mivšek, Nuša Rogan, and Petra Petročnik

1.1 Introduction

Infertility affects millions of people across the globe, report World Health Organization [1]. Looking through time, the rates are increasing [2]. WHO criteria for defining semen quality are lowering [3]. It seems as that human race is losing the natural potential to procreate. Can midwives expect in the future that we will no longer consider contraception as the main issue of reproductive care and counselling to youth, but will focus on preservation of fertility and counselling regarding the fertility awareness instead?

We cannot predict so far in advance. However we are becoming aware that just taking care for healthy pregnancy, normal birth and postpartum is not enough. As core health professionals for reproductive healthcare, midwives must undertake more proactive role also in the preconception period. This period strongly affects the health of the mother during and after pregnancy and has long lasting effect on the health of her descendants. Health policy makers and professional health institutions are becoming more and more aware that the health of future generations is set long before the children are actually born, therefore they are emphasizing the importance of preconception health care. Lancet series devoted a whole volume to this topic [4].

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I. Darmann-Finck, K. Reiber (eds.), *Development, Implementation and Evaluation of Curricula in Nursing and Midwifery Education*,
https://doi.org/10.1007/978-3-030-78181-1_1

1.1.1 Preconception Health Care

Preconception health care is defined very differently. WHO [5] defines it as provision of biomedical, behavioural and social health interventions to women and couples before conception occurs in order to reduce maternal and child mortality and morbidity. Also American College of Obstetricians and Gynaecologists [6] see it as actions that modify biomedical, behavioural and social risks to the woman's health and affect pregnancy outcome through prevention and management to maximize health outcomes. However, we argue that both definitions describe family planning strategy, rather than broader concept of preconception healthcare.

We understand preconception period as a period in individual's life that starts long before the person was conceived. With the awareness of nutritional programming, we know that life-style choices that our mothers made before fertilization co-create our life. And if we take into the consideration that our mothers' oogoniums (that we were made from) were formed during the pregnancy of our grandmothers, we can assume that our grandparents' decisions also form our today's well-being and ability to procreate. Our fertility is therefore defined by past generations. And our grandchildren's fertility depends on our life-style today. Looking on the issue of preconception health through such wide lens, opens new possibilities for health care promotion. And it strengthens the role of a midwife as a professional that is responsible for the reproductive health of women and their partners.

1.1.2 Midwives' Role in Preconception Healthcare

Core midwifery competencies re-defined in 2019 by the International Confederation of Midwives [7] claim that midwife is responsible also for pre-pregnancy care. If a woman wants to get pregnant once and if a man wants to conceive a child someday, they need to be aware what affects their ability to reproduce already in the beginning of their reproductive path. Therefore, responsibility of a midwife is also educating children about menstrual cycle, counselling regarding contraception and open discussion about sexuality with teens. WHO [8] and ACOG [9] developed very detailed list of risk factors for reproductive functioning that could serve as screening checklists. Risks are divided into categories such as genetics, chronic diseases, medications, STIs, vaccination, behaviour, etc. as presented in Table 1.1.

Some of these risk factors cannot be influenced upon (like genetic medical conditions) and some are moderately amenable to individual (for example, environmental hazards). However, person can have very strong impact on behaviour risks; therefore, midwives' counselling should focus on these topics the most.

In order to provide evidence based and professionally sound advices regarding the detriment effects on ability to procreate, midwives need knowledge regarding potential risks that pose a threat to fertility of a man or a woman. Therefore, it is necessary that we equip future graduates of midwifery with counselling skills and knowledge for advising clients how different life-choices can aggravate conception in their future.

Table 1.1 WHO risk factors that pose threat to fertility (adapted from WHO [5])

Age and fertility	• Providing age-appropriate comprehensive sexuality education; contraceptive provision to adolescents • Influencing cultural norms that support early marriage and coerced sex; empowering girls to resist coerced sex and engaging men and boys to critically assess norms and practices regarding gender-based violence and coerced sex • Providing contraceptives and building community support for preventing early pregnancy • Educating women and couples about the dangers to the baby and mother of short birth intervals • Screening and diagnosis of couples following 6–12 months of attempting pregnancy and management of underlying causes of infertility/sub-fertility, including past sexually transmitted infections (STIs)
Nutrition and body weight	• Screening for anaemia and diabetes • Supplementing iron and folic acid • Monitoring nutritional status—Body mass index (BMI) • Management of diabetes, including counselling • Promoting exercise • Iodization of salt
Family and personal medical history	• Genetic carrier screening and testing and addressing possible issues • Identifying chronic diseases that could affect reproductive health • Assessing psychosocial problems, family violence, female genital mutilation (FGM) • Promoting safe sex practices through individual, group and community-level • Ensuring increased access to condoms • Screening and counselling for STIs (including partner) • Antiretroviral therapy for prevention and pre-exposure prophylaxis against human immunodeficiency virus (HIV).
Substance use	• Screening and providing brief tobacco cessation advice and intensive behavioural counselling services • Advising about harm of passive smoking • Screening for other substance use; providing brief interventions and treatment when needed • Establishing prevention programmes to reduce substance use in adolescents
Environment issues	• Protecting from unnecessary radiation exposure • Avoiding unnecessary pesticide use/providing alternatives to pesticides • Protecting from lead exposure • Avoiding methyl mercury in fish • Providing guidance and information on other environmental hazards
Vaccine preventable diseases	• Vaccination against rubella • Vaccination against tetanus and diphtheria • Vaccination against hepatitis B

ICM's Global standards for midwifery education [10] are derived from basic midwifery competencies; therefore, they should prepare graduates also for active role in preconception period. However majority of midwifery study programs still consider the main role of midwives in pre-, intra- and post-natal care.

The aim of the described study was to determine the knowledge about risk factors for fertility among midwifery students. The results would serve us to implement the study programme and develop the preconception health module for undergraduate study programme.

1.2 Methods

Quantitative research approach was used, testing midwifery students' knowledge on risk factors for fertility, especially those that are amenable by the life-style choices (focusing on substance use, nutrition and physical activity, STIs and contraception, stress and certain environment factors).

Questionnaire was designed on the basis of literature review, with linking and adapting questions of similar researches [11–17]. The final version of the research tool was translated through double blind translation process. We have compared the translated and original English version and found no essential differences of the content; however, we had to change Slovenian statements due to preserve the meaning of some phrases as in the original. Questionnaire consisted of 28 questions, mostly closed type, that were divided into three main categories: a) demography, b) perceptions and knowledge of students regarding the risk factors for fertility and c) students' life-style regarding these risk factors. Questionnaire was pilot tested on the group of six participants (specialists from the field of nursing, midwifery, gynaecology and obstetrics and sociology) that were not included in the main study. They reported that questions were understandable. We have tested reliability of the questionnaire and results of Content Validity Index were adequate (I-CVI and S-CVI/Ave 0.84).

Research was ethically assessed by the educational institution, where midwives are being educated (in Slovenia only one health faculty educates midwives, with annual intake of 20–30 students). Formal consent was obtained by the institutional management. The research was distributed to the students via institution; we have used online survey tool 1KA [18], since the research was performed during spring lock down due to COVID in 2020. Students were invited to participate in the study, they were informed that their participation is voluntary and that confidentiality is assured to them. Link to the survey was active for 30 days. Participants got one reminder during the data collection.

We have used purposive sample; all students of the first and 3rd (last) year of the study were invited to participate in the research ($N = 52$). Since we wanted to compare the knowledge and attitudes of students at the beginning and in the end of the study, we have decided not to include second year students in the survey.

Basic descriptive statistics was calculated. Data from 1KA was imported into the SPSS 25 statistic programme [19]. We have tested statistically significant differences between students of first and third year of the study with Binom and Kullbachovega test ($p > 0.05$).

1.3 Results

We have received 32 answers, 62% response rate. Twenty students were from third year of study and 12 from the 1st.

All students knew what expression "fertility window" means and agreed with the statement that causes for infertility can be found in both partners; 94% of students knew the definition of infertility. Majority of participants estimated that woman is the most fertile in the age from 20 till 24 (91%), while 6% of participants chose the answer "from 25 till 29" and 3% the statement "from 16 till 19". Approximately half (56%) of participants answered that the fertility in women begins to decline between age of 35 and 39. 22% of them chose answer "between the age of 25 and 29", 13% the answer "between the age of 40 and 44 year" and 9% "after the age of 45". In case of male fertility 69% agreed with the statement that age affects also fertility of men. Two-thirds (66%) of participants answered that fertility in men decreases after they have reached the age of 50. 22% of students answered that fertility in men starts to decrease earlier (between age of 40 and 49), while 13% of students answered the option "fertility starts to decrease in men after the age of 30".

In the second block of questions we have asked participants about risks factors that influence fertility. They had to estimate which factors pose risk and whether they affect fertility of only men, only women or both. Answers are summarized in Table 1.2.

Third part of the questionnaire tested whether participants make healthy life-style choices and protect their reproductive health. 72% of students drinks caffeinated drinks; 26% of students drinks more than 300 mg of caffeine per week, 22% less than 100 mg, others up to 250 mg. 47% of participants consumes alcohol drinks; 10 students up to 1 unit per week and 5 students more than 1 unit. Only 1 student smoke (less than 10 cigarettes per day), however 25% of students is exposed to cigarette smoke. Two students (6%) consume other substances: 1 ecstasy, 1 marihuana. Three quarters (75%) of participants reported regular moderate physical activity (150 minute per week), 9% reported intensive sport activities, while 16% is not active. When having sexual intercourse 78% of participants regularly use condoms. 3% thought STIs do not have influence on fertility. When we asked about their opinion how they could protect their fertility (open ended question), the majority of ideas (42%) fell into the category of healthy life-style (healthy nutrition, physical activity, no nicotine and alcohol consumption, etc.). The second most commonly mentioned category (35%) was healthy sexuality (few sexual partners, regular gynaecologic checks, use of condoms, treatment of vaginal infections, etc.).

Most common source of knowledge about the topic of reproduction and fertility was reported to be study programme (66%), others listed also other sources, such as internet and social media (17%), family and friends (6%), health professionals (11%). All participants agreed with the statement "fertility and preserving the ability to conceive baby once, is important for me" and majority (94%) would wish to have more information on this topic.

Table 1.2 Answers of students regarding the threat of different factors to fertility (expected answers are in bold font)

Factors that affect fertility	Answers, *N* (%)					
	No risk	Risk for woman	Risk for men	Risk for both	Do not know	Together
Age over 35	0 (0%)	19 (59%)	0 (0%)	**13 (41%)**	0 (0%)	32 (100%)
Genetics	0 (0%)	0 (0%)	0 (0%)	**32 (100%)**	0 (0%)	32 (100%)
Smoking	0 (0%)	1 (3%)	0 (0%)	**31 (97%)**	0 (0%)	32 (100%)
Use of alcohol	0 (0%)	0 (0%)	0 (0%)	**32 (100%)**	0 (0%)	32 (100%)
Coffee	4 (13%)	3 (9%)	0 (0%)	**24 (75%)**	1 (3%)	32 (100%)
High ITM	3 (9%)	11 (34%)	0 (0%)	**18 (56%)**	0 (0%)	32 (100%)
Low ITM	0 (0%)	12 (38%)	0 (0%)	**20 (63%)**	0 (0%)	32 (100%)
Stress	0 (0%)	1 (3%)	0 (0%)	**31 (97%)**	0 (0%)	32 (100%)
Moderate physical activity	**25 (78%)**	1 (3%)	0 (0%)	5 (16%)	1 (3%)	32 (100%)
Intensive physical activity	10 (31%)	3 (9%)	2 (6%)	**13 (41%)**	4 (13%)	32 (100%)
Gonorrhoea	1 (3%)	10 (31%)	1 (3%)	**18 (56%)**	2 (6%)	32 (100%)
Human papilloma virus (HPV)	1 (3%)	18 (56%)	0 (0%)	**10 (31%)**	3 (9%)	32 (100%)
Exposure to chemicals, radiation, heavy metals	0 (0%)	1 (3%)	2 (6%)	**29 (91%)**	0 (0%)	32 (100%)
Chronic diseases	0 (0%)	1 (3%)	0 (0%)	**31 (97%)**	0 (0%)	32 (100%)

There was only one statistically significant difference between answers of first and third year students and that was about the influence of ageing on fertility. Kullbach test (likelihood ratio) showed that more first year students (80%) agreed with the statement that age over 35 affects only woman's fertility in comparison to third year students (25%) ($p = 0.048$).

1.4 Discussion

The environment of the study can affect the research; therefore, we must be aware that results of the study might be different in other circumstances (higher response rate in case that study would not be performed online). We must assume that only highly motivated students with the interest for the topic of preconception responded. Results regarding the knowledge of preconception healthcare might be different if all students would participate in the study. Looking from the other point of view, online survey in our case could also be advantage. Participants revealed very sincere information about their life-style that in person might not (for example, substance use). Another limitation of the study might be a small sample size, however with the annual intake of 20–30 students of midwifery in Slovenia, we have achieved the reliable sample that gives us an important insight in the attitudes and knowledge regarding the reproduction of Slovenian midwifery students.

We can conclude that midwifery students' knowledge about fertility and infertility is good; however, we would expect a higher awareness regarding some risk factors that affect reproduction (especially age of men, STIs and BMI). Even though participants quote study programs to be the most important source of their knowledge about (in)fertility, there were no significant differences in knowledge when comparing the answers of first and third year students. Educational programme for midwives should therefore be systematically upgraded with preconception health contents. Another disturbing fact was that despite that they knew about the risks that certain factors pose on fertility, their own lifestyle can be defined as risk behaviour. More should be done also to change the attitudes of young adults; if fertility would be considered a value for them, their behaviour might change. Only transferring the knowledge is not enough. In order to impact behaviour, different approach in the education must be undertaken. This was taken into the consideration when creating a preconception health module for the implementation of the midwifery study programme.

1.5 Development of Study Module Preconception Health

It should be noted that some topics of preconception health were already briefly present in the existing midwifery study programme [20]. However, the topics were rather fragmented and hidden under different modules, therefore failing in presenting the importance of the preconception health as a whole. For the development of the module curriculum, the Kern's six-step approach has been used [21]. This approach has been widely used in a range of medical as well as other health-related disciplines and therefore recognized as an appropriate tool for the curriculum development of the preconception health module. Details of the six-step approach are presented below.

1.5.1 Step 1: Identification of the Problem and General Needs Assessment

It became clear that there was a need to restructure the midwifery programme and to present the importance of the preconception health in a separate module in the curriculum. As mentioned earlier, the need for this was identified by the findings of this study as well as the ICM [7] essential competencies for midwifery practice. In addition, two of the authors were involved in the Erasmus plus project from European Union entitled "PreconNet: preconception health of youth, bridging the gap in and through education" [22]. The project addressed the challenge of male and female fertility as the current trend in Europe and also in some other countries, since data shows that fertility rates are decreasing and couples are postponing the decision to become pregnant. However, the biology of fertility cannot follow this social trend. The project therefore aimed to raise awareness of fertility across Europe and beyond. Project results (various educational materials) also contributed to the

preparation of a study module on preconception health and were used as a basis for the development of a study module on preconception health in our BSc midwifery degree programme.

1.5.2 Step 2: Targeted Needs Assessment

The results of our study indicate that the existing midwifery programme could equip students and thus future midwives with more detailed knowledge regarding the preconception care. The study conducted was the basis for the development of the new curriculum and the preparation of the new module. Midwifery students need an in-depth knowledge of the elements of the preconception health and care, along with a focus on the factors that influence women's and men's ability to start a family.

1.5.3 Step 3: Goals and Objectives

Based on current guidelines from international bodies, such as ICM's Global standards for midwifery education [10], as well as other current literature [4], there is a need to develop a new curriculum that prepares midwifery graduates for their active role during the period of preconception care. The aim is to provide information, teach practical skills for counselling and also to change the students' own perspective—to educate and raise individuals who value fertility and promote lifestyle choices that protect it. These have been defined as the main components of the module that build midwives' competence in preconception health counselling and are shown in Fig. 1.1.

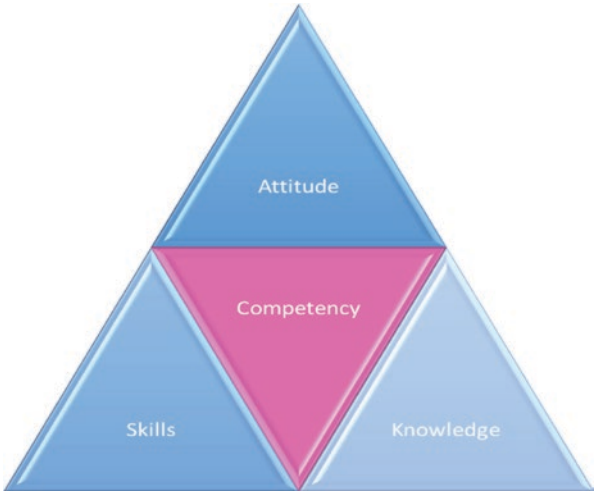

Fig. 1.1 Preconception module components

1.5.4 Step 4: Educational Strategies

The study module on preconception health was carefully planned and structured. The module on preconception health consists of the following learning content:

- Reproductive health with anatomy and physiology of male and female in relation to reproduction;
- Sex education with details on sexual intercourse, prevention of sexually transmitted infections;
- Family planning with prevention of unwanted pregnancies, healthy lifestyle and avoidance of harmful habits and the factors affecting fertility and pregnancy;
- Basic gynaecology in relation to reproductive health in the pre-pregnancy period.

It has been recognized that ex-cathedra lectures do not adequately equip students. In order to provide students with all the information and skills they need, it is necessary to use a variety of approaches. Especially when teaching values to change attitudes, different methods have to be used [23]. In addition to theoretical knowledge, the module aims to equip students with practical experience in delivering sex education. As part of the module, students will create and put into practice a sexuality education plan for adolescents. Therefore, the module will include practice-based strategies and active practice of counselling skills. The module will also include seminar work based on the problem-based learning method and oral presentations to practice writing and communication skills. In addition, students will practice their effective communication and counselling skills through role play. The module will involve the use of interactive online learning tools prepared by an international team of experts as part of the previously mentioned PreconNet project. The online learning tools will include topics related to basic reproduction, lifestyle factors, pre-existing medical conditions, age and fertility, and environmental factors. There were several reasons to support the module with online learning tools. First, online learning tools provide a reusable learning object. As a result, students play a more active role in their learning process and can be more self-directed in their learning. Another reason is the use of information and communication technologies that can enhance student learning, support different learning styles and make the learning process more dynamic [24].

1.5.5 Step 5: Implementation

The curriculum for the preconception health module is currently being revised by the Faculty Committee of Programme Quality and will be implemented into the programme over the next 2 years. The aim is that the new module will be implemented when the midwifery programme is renewed. The module is planned to be piloted in 2022.

1.5.6 Step 6: Evaluation of the Curriculum

The delivery of the course and student response to the course will be closely monitored for feedback and ideas for further improvement. To date, the evaluation of the module is planned and aims to have students evaluate the module curriculum by completing the evaluation forms. Our aim is to collect students' expectations before the module starts, halfway through and at the end of the module to show the benefits and future improvement opportunities. We are currently evaluating the online learning tools from the PreconNet project. The results of the evaluation will provide us with detailed feedback from our target learners—student midwives.

1.6 Conclusion

We can conclude that, on average, the midwifery students who participated in our survey have a good knowledge of fertility and infertility. However, there is room for improvement, particularly in relation to certain aspects of pre-conceptional health that impact on reproduction, such as male age, STIs and BMI. As no differences in knowledge about (in)fertility were found among first or third year students, it is questionable whether the primary source of their knowledge was really their studies themselves.

We believe that modifying the curriculum with the carefully designed module on preconception health will contribute to better knowledge and self-awareness regarding the health in preconception period. In addition, it could help to improve students' attitudes towards their own lifestyle. It is therefore expected that under the proposed changes in curriculum development, students will change their attitude and make conscious choices based on appreciation of preconception health and fertility. As midwives, we should be a role model for lay people; promoting healthy habits is only successful if we live by the principles, we advocate.

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2 Detailed Curricula Based on Work-Processes: The Need for Updating the Conventional Approach for Developing Curricula in TVET

Georg Spöttl, Gert Loose, and Matthias Becker

2.1 The Basis for Developing Curricula in TVET

When it comes to presenting vocational education in an operational form two elements which are closely interlinked should be considered: the establishment of occupational standards and the development of curricula. This basic position points towards the strengthening of qualification research by making use of adequate methods which are—as a rule—interdisciplinary.

Hence, the interrelationship between qualification research on the one side and the establishment of occupational standards and the development of curricula on the other side presumes that there is the need for an interdisciplinary dialogue. Benner [1] thinks that this dialogue is being safeguarded by the identification of "paradigmatic situations".

Occupational work situations are identified in this process and eventually become the starting point for the development of vocational curricula [2]. This position of scientifically oriented curriculum development for vocational education places in perspective the classical differentiation between "qualification structures" and "curriculum structures" and establishes a close interdependency between the two. Qualification research for vocational education identifies the work tasks characteristic for a certain occupation and the embedded needs for qualifications, and investigates the didactical ranking of these tasks for competence development. Scientific

The article is based on the publication of Spöttl, Loose & Becker in 2020.

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I. Darmann-Finck, K. Reiber (eds.), *Development, Implementation and Evaluation of Curricula in Nursing and Midwifery Education*,
https://doi.org/10.1007/978-3-030-78181-1_2

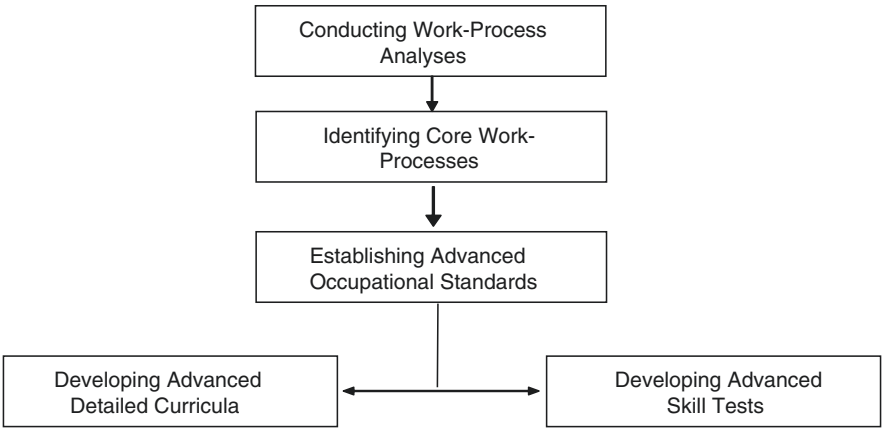

Fig. 2.1 From Work-Process Analysis to Advanced Detailed Curricula and Advanced Skill Testing—An Overview. With permission from Peter Lang Verlag

investigations in vocational education presume that empirically oriented qualifications research forms the basis for a curriculum. The shaping of the curriculum is then rather influenced by didactical, pedagogical and other theoretical ideas, which must be reflected there. This means that curricula are marked by structural characteristics relevant for vocational education.

Curriculum development is a complex process that cannot be separated from the outcomes of qualification research and normative decisions on the "contents" orientation of curricula. As soon as one aims at thoroughly capturing work-process related challenges with a view to competence development, the question arises which methods of qualification research are best suited to achieve this task. The way described here concentrates on work-process oriented research accessing the theoretical and practical knowledge inherent in skilled work. Thus, it is ensured that work-processes with all their relevant implications become the core of shaping curricula. In order to identify the normative processes of the concrete shaping of curricula, the authors rely on participative procedures.

Hence, the main steps for developing Advanced Detailed Curricula are presented in Fig. 2.1 below (ibid 2020).

2.2 Establishing a Platform for Development of Advanced Detailed Curricula

2.2.1 Ensuring the Relevance of Curricula

The idea of acquiring skills that will last for a lifetime can no longer be pursued. Steadily increasing complexity and rapid technological change in the workplace create a need for competences that respond to changing and as yet unforeseeable requirements. Consequently, we can no longer rely on an analysis of only those

competences needed in the workplace today, and then use that analysis as the basis for designing the curricula and training programmes. Instead, a change of paradigm is necessary [3] in order to understand the dynamics which occur in the workplace as they are reflected in changing work-processes. Hence, the common platform for skills training which has been established by competence-based standards such as the NVQs (National Vocational Qualifications) in many countries has to be upgraded to meet the demands of increasing complexity in the workplace and rapid technological change.

These challenges call for reaching beyond this common platform into the work-processes themselves and to create a curriculum that can cope with today's uncertainty in the workplace. Therefore, it is not enough to capture duties and tasks at the workplace—as has been the central concern of the DACUM ("Developing a curriculum") approach [4]. The main focus of this approach is task oriented, but tasks do not include all the implications of work that are relevant for advanced curricula. Instead, it is necessary to delve into the work-process and conduct a "work-process analysis"[1] to identify all competences that are required within the overall work procedure. This in turn leads to the further question of how educational content and vocational knowledge could be related to the students' needs and the process of competence development.

Curriculum development faces the great challenge of identifying educational content, vocational knowledge, and vocational capability (i.e. students' needs) such as intellectual understanding, values, verbalised concepts, motor skills and physical issues. This is due to the fact that vocational knowledge and capabilities are content related and holistic. Traditional methods of curriculum development (such as "didactical reduction", "functional analyses", etc.) cannot meet these requirements. They ignore the holistic, situational and work-process related quality of work [6, 7]. Work-process related curricula furthermore fulfil two essential requirements: temporal stability as well as orientation on content related holistic competences. While technology-focused curricula are quickly becoming obsolete due to the high dynamic of innovations, work-processes are extremely stable over the time.

Nowadays, curricula are required in which the guiding structure is provided by authentic working practices, the requirements of the work-process and the work-process itself. For successful learning, we first need to progress beyond "narrow" skills to acquire "broad" competences which enable the learner to cope with uncertainty and change in the workplace; secondly, domain-specific skills that are basic

[1] A work-process analysis ([5]: 189) is an on-site survey of skilled work. It identifies the knowledge, skills and competences for mastering, the execution and the shaping of occupational work tasks. In order to gain insights regarding competence development of individuals, the framework of work-process analyses focuses on the survey of processes, embedded challenging situations, tasks and problems occurring during work; and above all on how they are coped with. Within the framework of work-process analyses, the coherence of work and the tacit knowledge and skills are revealed. Thus the context for competence development and for the application of occupational knowledge is determined.

for what we call a "core work-process"[2] in a particular occupation must be identified and conveyed; and thirdly, the work-process knowledge behind the work-processes under study has to be identified. The work-process knowledge encompasses the theory that is required to perform competently in a work-process, which includes aesthetic, moral, societal and technological aspects ([8]:31, [9]).

This article gives an overview of the necessary steps from planning a work-process analysis to the development of so-called Advanced Detailed Curricula (ADCs). Ways will be shown of shaping the core work-process structure in order to guarantee work-process based curricula. The guidelines are based on empirical surveys conducted in different sectors of industry in a number of European and Asian countries.

2.2.2 Work-Process Based Qualification Research as a Basis for Curriculum Development

2.2.2.1 Approaches of Qualification Research

Traditional occupational profiles and standards for most economic sectors are structured in many countries by following the subject background involved. This systematic does not take into account the increasing importance of the changes taking place in work-processes in the context of the Fourth Industrial Revolution and the requirements of work as such [10, 11]. Consequently a curriculum approach is needed which has a dynamic character to respond to the requirements of the changing world of work.

Such a positioning of curricula is of great importance since vocational education's role as secondary education is continuously questioned. This is due to the worldwide trend towards academic contents which is fueled by the concept of a knowledge society.

For effective identification of requirements for today's work and its complexity, it is necessary to involve research approaches which grant access to work, work-processes, changes of work and the related implications. The results provide the essence of conclusions with regard to the need for qualifications, occupational profiles, the shaping of curricula and consequences for learning processes.

In this process it is of special relevance for vocational education and training to establish linkages with social structures of work and competence development so that society can participate in co-shaping the objectives of education. This has to be closely interlinked with competence development for the performance of occupational tasks and work-processes. To consider the variety of dimensions of

[2] Core work-processes are usually formed around specific skills and may constitute a complex arrangement of related skills. Typically core work-processes form a skill set such as "manually fabricating a joint" as in "carpentry". Core work-processes always integrate components or systems of a "product" or a "service" under a work perspective. This leads to a "structure of work" instead of a "structure of technology". The "structure of work" is the basis for the competence model.

work-processes and an understanding of development of occupational identity, personal satisfaction through working in work-processes ensures an education-oriented curriculum development and overcomes a mere utilisation orientation (cf. [12]: 369 f.). This means that educational contents will be conveyed by working in an occupation (*German: "Bildung im Medium des Berufs"*).

One of the main tasks in this context is the selection of a research approach that is sophisticated enough to be used to identify the implications of work and work-processes relevant for curriculum development. The selection of an adequate approach depends on the objectives of curricula in the context of vocational education. In the present case, the "term of curricular structure in the sense of a curricula theory is understood as construction alignment and interior interrelationship of curriculum elements according to certain principles which shape curricula" ([13]: 204, [14]). However, curricula have to be translated into practice—and have to be open to critical scrutiny [15] while supporting the shaping of competence. In our specific approach, the objectives of the curriculum are oriented towards the concept of core work-processes and towards the procedures of evaluation and assessment [16]. This understanding of curriculum development can be combined with different procedures, such as participative approaches (cf. [17, 18]).

Direct involvement of a target group for curricular decisions—i.e. the skilled workers and key persons of the companies—is essential. These persons have to be actively involved in supporting the analyses of skilled work and of the incorporated practical know-how and skills throughout the identification of work-processes. They are part of the development process and they thereby legitimise the results of the analyses.

2.2.2.2 Work-Process Based Curriculum Development

In traditional curriculum design (e. g. subject-based curricula), requirements of an occupation as a whole (for example, the maintenance of a car as an entity) are hardly ever the subject of vocational training. This is not only due to the fact that the skilled trades are specialised either regarding the mechanic or the electronic systems of a car or even regarding other components such as the engine, brakes or bodywork. This subject-systematic, technology-centred curriculum design which focuses on the systematisation of the particular subject is burdened with the following shortcomings:

- The content is largely divergent from the work-process.
- Separation of the basic training from the work-process leads to motivation problems among the trainees.
- The curricula are overloaded with topics and subjects which are not practice-oriented.

The subjects at all levels of differentiation should be designed in a work-process oriented way. Work-processes are analysed and structured by the outcomes of expert interviews. The core work-processes have to be structured according to a concept which enables a beginner to develop into an expert. Based on the actual

competences for work involving high-technology and society, the competence development model described here is aimed at qualitative reorganisation, moving on from a philosophy of "regulation-guided know-that" towards "experience-based know-how" ([19]: 41; [20]).

Following this approach, the core question is which contents should find their way into vocational education and training and how they should be structured. Contents with a special relevance for curricula are deep work interrelationships which have to be identified with the help of work-process based research. Such contents are the basis for conceiving complex learn-and-work arrangements for the qualification of employees for occupational action fields.

In order to ensure the proper work orientation of the curricula, work-process analyses have to follow scientific structures in vocational education which concentrate on the identification of work interrelationships and the competence dimensions of skilled workers. Work-processes thereby pursue the following three aims:

1. to identify the *competences* for the managing and shaping of occupational work tasks;
2. to access the most important coherences for *competence development*;
3. to determine the *work-process knowledge* for the shaping of business and work-processes.

With their three categories of objectives, i.e. *competence, competence development* and *work-process knowledge*, these objectives reflect supplementary principles for determining the contents of curricula. Reetz and Seyd concluded that this leads to three different curriculum structures and approaches (science principle, personality principle and situation principle; [13, 21]). Work-process analyses have to take into consideration all three principles. The target is to offer a bottom-up approach for curriculum development.

Each of these three skilled work-related dimensions of work and learning correlates with one another. In this way the demands for skilled work and for technology are reflected in the object of the skilled work and also in its methods, its tools and its organisation.

2.3 A Guideline for Developing Advanced Detailed Curricula

2.3.1 Conducting Work-Process Analyses

The steps will now be described which have to be taken in order to define the domain-specific skills and the broad competences that are required for successful performance in high-tech occupations. To this end, work-process analyses should be conducted and used to establish "Advanced Occupational Standards" (AOSs) as a step necessary in this procedure.

However, at first the context in which we place these analyses must be determined. The focus is on competence development through skilled work as learning to act autonomously and professionally with regard to all skill requirements within an occupation or an occupationally meaningful area of activity (e.g. repairing a car, manufacturing the timber roof structure of a house, or engaging in recycling) (cf. [22]). The first two activities refer to skilled occupations while the last activity at least refers to exhibiting a "skilful", professionally optimised approach regarding the performed work.

Conducting of work-process analyses holds the key to establishing Advanced Occupational Standards which themselves contain the basis for designing effective curricula and state-of-the-art training programmes.

Based on defining a reliable method of conducting these analyses and establishing the standards, it will be possible to unfold the essence of acquiring the competences that are needed in the workplace today. Consequently, it can be stated that it is necessary to conduct work-process analyses to generate an insight into these competences. When conducting these analyses, our threefold concern goes beyond the identification of routine skills—such as using a screwdriver to fasten screws:

The *first* step is to identify "broad" competences which enable the learner to cope with increasing complexity and rapid change in the workplace—such as interpreting the results of the fault diagnosis of the latest generation of engine-management systems in a car; *secondly,* we need to identify and to convey the domain-specific skills that are basic to what we call a "core work-process" in a particular occupation. An example of such a core work-process and the corresponding domain-specific skills would be "polishing" for the domain (occupation) of "carpentry"; and in a *third* step the identification of the work-process knowledge behind the work-processes is under study. The work-process knowledge encompasses the theory that is needed to perform competently in a work-process which includes aesthetic, moral, societal and technological aspects.

Roughly eight to twelve "core work-processes" constitute a skilled occupation, and it is necessary to go deeply into the actual work-process in order to identify the broad competences which are relevant for the required flexibility at the place of work and the core elements which are domain-specific. The approach of identifying the broad competences together with the domain-specific skills required in an occupation has already been mentioned above.

Consequently, conducting a series of on-site work-process analyses is an indispensable part of developing AOSs. It is the core of the development process, which leads to effective detailed curricula and it therefore requires careful consideration. A work-process analysis always has to collect all details of how to cope in a work-process and therefore has to be an on-site analysis. It can in no way be replaced by expert opinion in a round-table setting. For a presentation of the structure which demonstrates how the work-process analyses are embedded as the core of the overall development process, see Fig. 2.2.

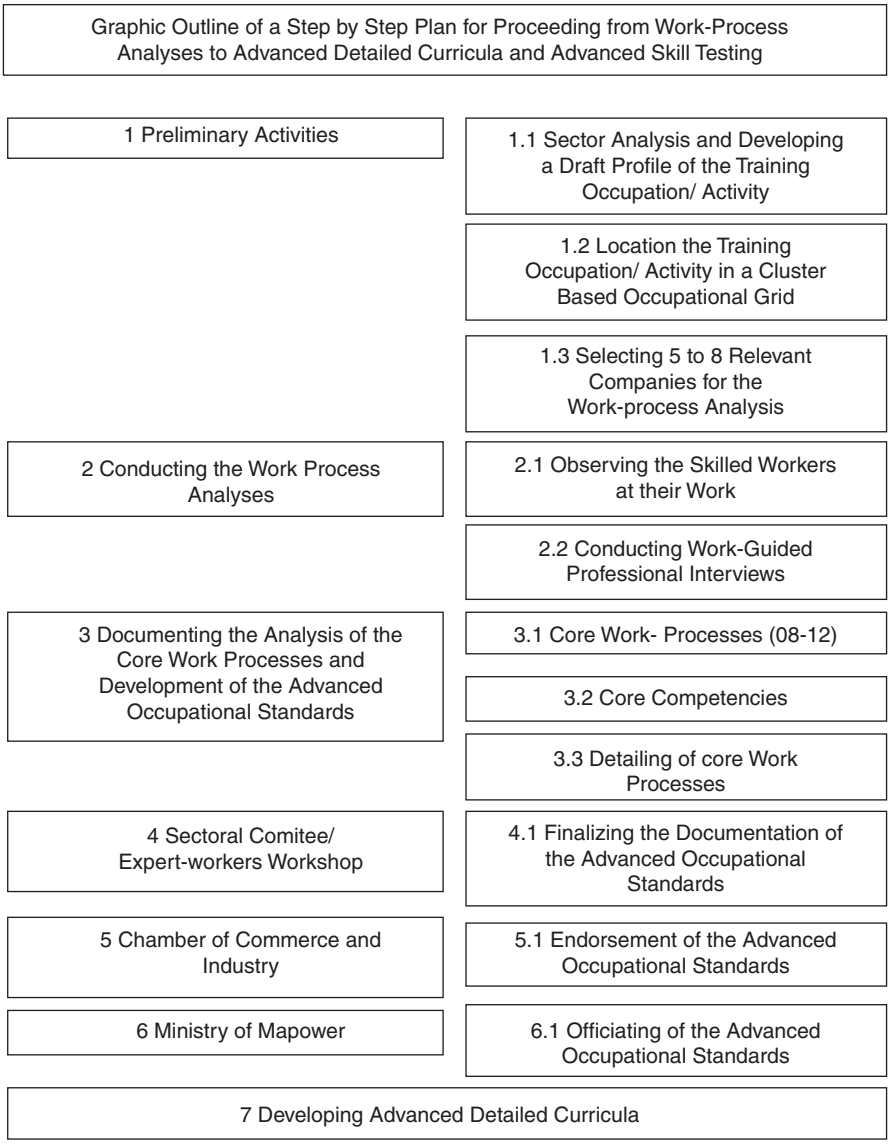

Fig. 2.2 Graphic outline of a step-by-step plan for proceeding from work-process analyses to Advanced Detailed Curricula. With permission from Peter Lang Verlag

2.3.2 The Steps of Conducting Work-Process Analyses and Establishing Advanced Occupational Standards

2.3.2.1 First: Establishing a Draft Profile of the Training Occupation/Activity

The "nucleus" from which the work-process analysis starts must be a draft statement regarding the nature of a particular occupation or activity and the training required in order to master it. This is called an "Occupational Profile". This should be accompanied by insights from a sector analysis [23] such as reference to related occupations/activities, a brief portrait of the social embeddedness of the particular occupation/activity including information regarding the salary and a brief description of the possible career progression paths. A list of the necessary components for the Occupation/Activity Profile can be found here:

1. Name of the occupation or activity.
2. Description of the related occupational cluster, group or sector.
3. Prerequisites to be eligible for working in this occupation.
4. Duration of education and training.
5. Specific skills and quality criteria for the particular profession.
6. Description of the typical scope of working fields and responsibilities.
7. Description of qualification to be obtained.
8. Training venue career perspectives (specialisation, further education, etc.).

2.3.2.2 Second: Embedding the Occupation/Activity under Study in a Structure Regarding the Level of Workmanship and Cluster of Occupations

For designing appropriate training programmes and for assisting individuals in finding their place in employment, it will be necessary to reflect the occupation/activity under study from the perspective of a total system's approach. This will provide important information regarding its contribution to the world of work, to the national economy and to the individual. This complex procedure of a total system's embeddedness can be partly facilitated by introducing two structural dimensions: "levels of workmanship"/"levels of skilled work" and "affiliation with occupational clusters" (cf. [24]).

2.3.2.3 Third: Forming a Team of Experts to Conduct Work-Process Analyses

The general traits of an occupation or activity have to be differentiated from what is unique in a particular situation and may therefore not be relevant for this purpose. Furthermore, it has to be observed that the work-process analysis is only the first, though important, step for proceeding towards the development of ADCs. Therefore, the team of experts through their qualifications also has to ensure the continuation of this development process towards the final product of detailed curricula.

The thrust of work regarding the work-process analyses lies with the subject-matter experts. That is why it is advisable to employ two senior experts in this area.

Ideally their qualifications should be supplementary to each other. Yet the mere fact that two experts are charged with this work already incorporates a corrective component.

In spite of the importance of the work of these two experts, the team-leader of the group of experts should be the senior expert for the format of the AOSs and for the procedure for developing curricula. This senior expert must have had prior experience with conducting work-process analyses and she or he will finally be responsible for keeping the group's work in line with the prescribed format and the proven procedure.

Furthermore, from the past experience we have come to the conclusion that there should be a senior expert for the development of curricula in the team. If there is no curriculum developer involved in the work-process analyses, it is more than likely that the process of developing the ADCs out of the AOS as the result of the work-process analyses will be held back by the curriculum developers' hesitation to accept the findings of the team. For a brief characterisation of the professionals who should be involved in the analysis (see Fig. 2.3).

And finally, it is necessary to consider the experience of experts concerned with the verification of the draft AOS that have been developed by the team of experts.

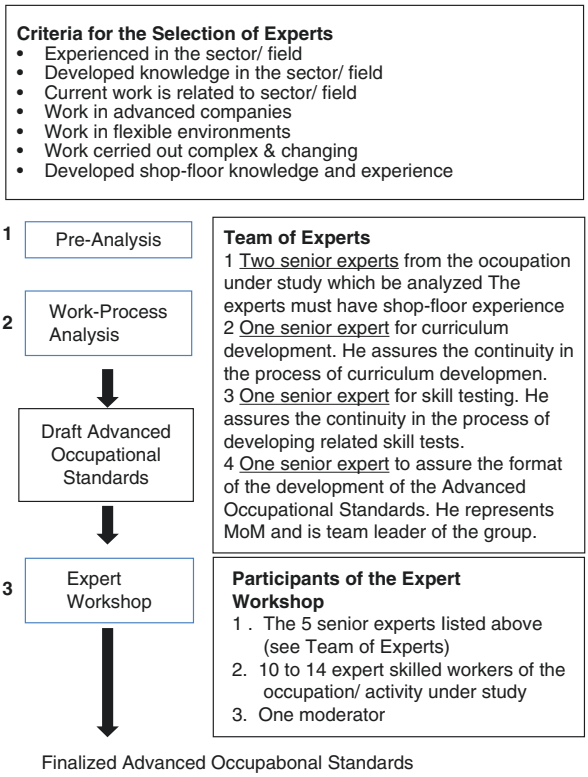

Fig. 2.3 Brief characterisation of the experts involved in conducting the work-process analyses. With permission from Peter Lang Verlag

For the purpose of this verification, either the draft standards should be submitted to a sectoral committee or an expert workshop should be convened.

2.3.2.4 Fourth: Conducting Basic Research Regarding the Profile of the Occupation and Tendencies of Further Development

The team of experts responsible for conducting the work-process analyses should be familiar with the professional literature of the occupation/activity under study and with the trends in further development, particularly regarding the required skills and competences. Their experience must include familiarity with the latest tools and equipment as well as procedures of work.

Basic research has to be conducted regarding the scope of skills and competences for this occupation/activity in the country in question, and any variation in their effectiveness at the different places of work. This research could focus on interviews with local experts, but it should also be extended to written sources such as the professional literature or publications by the chamber of commerce and industry, relevant professional institutions or similar bodies.

Furthermore, this basic research should encompass an analysis of the organisation of the particular companies to be visited, with regard to their range of products or services and the design of their work-related organisation. This initial information can usually be taken from brochures and leaflets provided by the company—if possible prior to the visit.

2.3.2.5 Fifth: Selecting Companies in which to Conduct the Work-Process Analyses

It is evident that the number of relevant companies for conducting a work-process analysis is too high to involve all of them. Consequently, the team of experts has to consider in which companies they are most likely to find "actual manifestations" of the work-processes they have in mind. Choosing five to eight companies can usually be expected to cover the variations in the design of the work-processes which we need to address, depending on the objects of the production/work-process, the size of the company and other variables.

Therefore, an appraisal of the relevant companies needs to be conducted regarding these variables. The selection should reflect the existing variations in the design of work-processes. If the diversity of the companies requires it, it may even be necessary to visit more than eight companies. One day should be allocated for conducting the work-process analysis and it may be necessary to visit the company again in the event that any clarification is needed. A brief documentation of the choice of companies to be visited adds transparency to this important process.

2.3.2.6 Sixth: Conducting the Work-Process Analyses

All observations during the company visit have to be carefully documented. The function of any particular occupational action within the work-processes at the company must be clear from the report of the visit. It is also important to document in detail the training background of the workers as well as special talents which they may have.

The work-process analyses have to reveal all implications of the work and detail all knowledge, skills and competences required for performance in the occupation under study. Observation of individuals at work and interviews with workers and management are the main instruments for generating this information.

Beyond the specific occupation/activity under study, the report needs to detail all business activities of the visited company, and to convey an impression of its level of sophistication (e.g. stating precisely the welding technologies that are employed in a company). Furthermore, it must describe which role these activities play in the overall portfolio of the company, or, in other words, how they are embedded in more extensive business processes. It will be important to outline all core work-processes that make up an occupation or activity and the work-processes behind them. This will lead the researcher to identify the domain-specific skills that are particular for a given core work-process and the broad competences which bring the necessary dynamics to the required skill base to enable the skilled workers to cope with changing requirements in the workplace.

Observation and interviews as the main instruments of the work-process analyses need to be given special attention. The work-processes need to be analysed by carefully observing the skilled workers at their work places. In particular, the following aspects have to be considered in this observation:

- the structure of the work-process,
- the organisation of the work tasks and the skills requirements that originate from the work-process,
- the competences that become apparent when considering the tasks that have to be mastered,
- the interconnections that need to be analysed behind the work, its contents, and the given circumstances that have an impact on the work as it is performed (cf. [25]).

A report has to be issued for each work-process analysis. This report serves as a documentation for the process of establishing the AOSs. It is suggested that the above detailing of the work-process analyses be employed as a means of structuring the report.

2.3.2.7 Seventh: Developing a Draft Advanced Occupational Standard

For each company visit, respectively, for each work-process analysis there must be a comprehensive report. This report should reveal how the occupation or activity under question fits into the overall production process of the company. Furthermore the report needs to describe the particular profile of the occupation or activity which we analyse in a given company. This report should be written by the subject-matter specialists in the team.

All information has eventually to be arranged into the format of the AOS. First a “narrative” has to be produced for each core work-process, followed by a “list of all core competences” which have to be employed in this core work-process and finally

a "detailed description" of the activities involved regarding the following specifications: objects of skilled work; tools, methods used and organisation of skilled work; requirements in terms of skilled work and technology in use with regard to the customer, the company and the worker himself.

The format of the AOSs with the core work-processes, their narrative, their core competences and the detailing of each core work-process must always be kept in the mind of the team of experts. All findings will later on serve as the details for establishing the standards and these details must be helpful in designing curricula or skill tests.

The fundamental idea behind establishing the AOSs is their function of portraying the entirety of skills and broad competences needed to perform the skilled work of a particular occupation/activity. In its structure this pool of skills and competences is composed in the following way: A sequence of core work-processes encompasses all areas of skilled workmanship which together constitute the total sum of all know-how, all competences and all required skills.

Therefore, it must be the first and foremost target of the work-process analysis to focus on the skilled workers, to identify the core work-processes and to arrange them in an order proceeding from the basic ones to the more complex. In most cases it is domain-specific skills which lend their uniqueness to the shaping of core work-processes.

2.3.2.8 Eighth: Verification of Draft Advanced Occupational Standards by a Sectoral Committee or a Workshop with Expert Skilled Workers

On the basis of our insights from the work-process analyses we have completed the draft AOSs with all their core work-processes. This presentation has followed the set structure of narrative, core competences, etc. as has been indicated above. This draft standard is then ready for verification by a sectoral committee or an expert workshop. And again: in any case, the team of experts who have presented the draft has to participate in this verification. The workshop concept for a validation or verification of an AOC draft should ensure that the order of the work-processes and referring learn- and work assignments support a development logical structure. That means that the paradigm of essential development tasks [1] and steps along the competence development towards an occupational profile plays a role for the assignment of curricula content and that the expert workers have to validate the order.

It is assumed that this double check will make sure that the team of experts who conducted the work-process analyses came to the correct conclusions and that necessary revisions are put into effect. Furthermore, the review by expert skilled workers is an important indication that the representatives of the occupation/activity as a whole are backing these standards as benchmarks for competence and competence development.

2.3.2.9 Ninth: Development of Advanced Detailed Curricula (ADCs)

A curriculum is a pathway to learning. We can build this pathway by first identifying the competences that are needed for performance in an occupation. The

complete set of these competences is termed an "Occupational Standard". The "Detailed Curriculum" is then the description of the learning programme, which enables the trainee to acquire the knowledge, skills and attitudes necessary to master the competences.

The conventional "Occupational Standards" had been developed out of the analysis of work tasks and consequently lost their validity when a task became outdated, e.g. by the introduction of new technologies or changes of work organisation. The new AOS are based on an analysis of work-processes and they attempt to grasp the change which is immanent in the work-processes.

The AOS for a particular occupation describes all competences needed for successful performance in the workplace. They therefore provide the basis for the development of a detailed curriculum. And since we need to maintain the advantage that the AOS have over the conventional standards, we should use the term "Advanced" Detailed Curricula for the new curricula.

The core work-processes and the sequence of core competences for each of them provide the overall structure of the contents for the Advanced Detailed Curriculum. Each core work-process is described in a narrative which already serves as guidance for curriculum development. The core work-processes are standing on their own and they therefore constitute an entity for the development of the detailed curricula. This entity is then further structured by grouping the core competences for each core work-process according to the work flow (i.e. the central areas of work) into about two to four sub-entities. And finally, the detailing of the core work-processes provides us with the content-base for the curriculum.

Consequently, the structure for the ADCs is evident. Nevertheless, the description of the individual learning events needs some further consideration. In order to proceed from just carrying out tasks to performing successfully in a changing work-process, we need to involve all capacities of the trainees, i.e. beyond their expertise in the technical/professional fields, they need to apply their human and social competences and their methodological competence combined with their willingness and capability for lifelong learning.

2.3.2.10 Tenth: The Five Steps of Detailing Advanced Detailed Curricula

The basic explanation for the background of the development of *Advanced Detailed Curricula* (ADCs) is intended to provide an orientation regarding the specific approach to curriculum development based on work-processes instead of tasks. With this orientation in mind we should now address the actual task of developing an ADC. This has to be done in a five-step process (Fig. 2.4).

Step 1: Overview Regarding the Competences that Need to Be Conveyed

As a necessary preparation for developing detailed curricula, the expert should go through the Advanced Occupational Standard for the particular occupation and understand how the whole occupational profile is build up around the sequence of core work-processes and the inherent core competences. Furthermore, the expert should intensely study the first core work-process. Starting with (1) the narrative for

Course Name	**Core Work-Process 01:** Standard Service				
CWP Outline	The purpose of standard service is to maintain the safety of the vehicle in terms of roadworthy operations and functions and therefore maintaining the utility/ resale value of vehicles and systems. All service tasks required for preparations, execution and commissioning are to be carried out. …				
Course Code	Course 01	**Level**	Skilled Worker	**Pre-Requisite**	xxx

Learning Areas (LA)	**Competence Based Outcomes**	**Mode of Instruction**	**Tools Equipment & Materials**	**Learning Environment**
LA 1: Vehicle Reception and Management	• Handle vehicle reception and identification, • Practically apply rules for customer relations,…	- Learn & Work Assignments, - Lecture …,	Vehicle, Order documents, Requirements for Service …, …	S = School SW = School workshop …

Professional / Technical Competences	**Social / Human Competence**	**Methodical / Learning Competences**
• Case of database for identification of vehicles, • Use of databases for identification of vehicles, • Carry through cost calculation, • …	• Communication with customer, • Cooperating with manufacturer and within workshop, • Enhance team concept, • …,	• Identifying vehicle on the basis of VIN, • Well organized service procedure, • Awareness of order procedure, • …

Fig. 2.4 Sample page of an Advanced Detailed Curricula

a comprehensive understanding of this phase of developing one's craftsmanship. Then going to (2) the core competences and understanding the internal structure of the particular core work-process, from the initial steps of getting prepared for this phase of craftsmanship to carrying out the core work-process and to delivering the product or service, or to moving ahead to another core work-process. Finally, (3) the detailing of the core work-process has to be carefully explored as a structured contextualisation of the work-process which represents this phase of the occupational domain. First the focus should be on the "objects of skilled work". Next, more specifically, the "tools (and) methods used, (and the) organisation of (the) skilled work" are outlined. And finally, the "requirements in terms of skilled work and technology in use" are introduced in relation to the customer, the worker and the company.

Step 2: Sub-Entities which Mark the Work Flow in a Core Work-Process

As already stated above, each core work-process has to be regarded as an entity based on the same structure. This entity encompasses all competences which constitute this core work-process. The core work-process is initiated in some way, is

carried through, and is completed in the delivery of a product or a service. Consequently, when developing a detailed curriculum, this entity needs to be further broken down into sub-entities which mark the detailed work flow within the particular core work-process.

In order to establish these sub-entities it is needed to refer to the core competences which have been defined for the specific core work-process. It is necessary to group and name the core competences according to central areas of work which have to be traced in their correspondence with the work flow. An established standard is to define between two and four sub-entities, such as e.g. for the core work-process of "Standard Service" for the Automotive Mechatronic (cf. [26]) and further sub-entities:

Step 3: ADC Based on a Structural Model of Occupational Work (for Example "Automotive Mechatronics")

Formulating the Advanced Detailed Curriculum is the main step to be taken, because it entails the formulation of all details needed to make sure that the worker/trainee will be able to perform successfully in the workplace. Our main resource for this step is the Detailing of the Core Work-Process. The "detailing" presents a structured outline of the whole work-process. It is based on the following perspectives of occupational work.

Objects of Occupational Work

The specific object of occupational work encompasses the technical systems, the functions of the technical systems and their components, the design and functional safety (e.g. of vehicles), the administrative services and the customer.

The Tools and Equipment Used, the Methods of Work that Are Applied As Well as the Organisation of the Work that Is Followed

This section encompasses the organisation of the workshop and of the particular workplace in connection with the employment of tools and equipment and the respective methods of work.

The organisational structure, the tools and the equipment have considerable implications regarding the complexity of the work-process and the methods of work that should be applied. They are important elements for determining the quality of occupational work and the requirements thereof. They have an impact on the wider organisation of the work-processes in all their details.

Requirements Regarding Occupational Work

Requirements regarding occupational work address occupational work externally. These requirements result from the interests of customers, from legal stipulations which stand for social interests, from the interests of employers, from health and safety considerations and from requirements that have been brought up by the workers themselves. This dimension is multifaceted, and secures the outcome of getting the work properly done from the perspective of society. This explains that

occupational work can just be regarded as a job to earn a living or as a task relevant for society and challenged by (moral and) ethical claims.

This whole scenario needs to be considered when developing the Advanced Detailed Curriculum. The aim for the training programmes must be to convey competence for performance in the work-process. This competence in performance is achieved by following a holistic approach which targets both the vocational and the personal development of the learner. Therefore it is the need to employ a model of competence that considers all capacities of the individual. We find it in a three-dimensional model of competence: It entails (1) technical/professional competence, (2) human/social competence, and (3) methodological and learning competence.

Competent performance in the work-process at the place of work needs to encompass all three dimensions of competence, yet since our focus is on the work-process, the technical/professional competence has a certain leading function in guiding us through the workflow.

All aspects of occupational work that are stated in the detailing of the core work-process have to be covered by the Advanced Detailed Curriculum with reference to the particular dimension of competence. The intrinsic value of addressing the three dimensions of competence partly lies in the transferability of the know-how that is being built up in each of them.

2.4 Conclusion

What is our concern? We want to identify the skills, competences and the knowledge that skilled workers must have at their command today in order to perform successfully in the workplace, particularly in high-tech occupations. The steps are establishing occupational profiles, conducting work-process analyses, following the format of the advanced occupational standards, defining the competences needed for performing in a work-process, establishing the structure of an advanced detailed curriculum, establishing sub-entities which mark the work flow in a core work-process and developing the Advanced Detailed Curricula for the sequence of core work-processes.

Only by applying work-process analyses we are able to unfold the complexity of today's work-processes. Consequently, work-process analyses, Advanced Occupational Standards and Advanced Detailed Curricula are the three subsequent, inevitable stages of development. They need to be mastered in order to proceed from defining an occupation or occupational activity to identifying the domain-specific skills and the broad competences, and designing the training programme for successful performance in this occupation/activity or for testing the command of the detailed competences.

A particularly skillful procedure is required when selecting the companies for the work-process analyses. This selection needs to provide a relevant image of the particular sector. It is especially advantageous that the work-process analyses encompass the regional business structures and that a transfer of the experience from other countries is not an option. For the teams who carry out the work-process

analyses, it is a special challenge to cover the business structures and at the same time to identify the qualifications that the skilled workers must have.

Again, it is a special advantage that all findings regarding the development of curricula are related to regional circumstances and exactly these requirements and qualifications are compiled before they become part of curriculum development.

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A Curriculum on the Basis of Qualification Research

3

Kordula Schneider, Heidi Kuckeland, and Christoph Hamar

3.1 Introduction

Curriculum development in vocational and business education gathered momentum following the introduction of the learning field concept by the Standing Conference of the Ministers of Education and Cultural Affairs in 1996. Since then, vocational work has provided the reference point for vocational curriculum development [1–3]. To be able to decode the qualification requirements as specifically, decisively and in as much detail as possible such that they can serve as a basis for vocational education and training curricula, it is important to empirically analyse occupational work processes [2].

However, the development of nursing curricula must not be reduced on identifying occupational work tasks since they represent only one part of nursing reality. Instead, vocational action situations [4] and their intrinsic constituent features, of which occupational work processes represent only *one* feature, must be empirically elicited in order to develop nursing curricula [5]. Until today, qualification research aimed at nursing curriculum development has rarely been carried out, especially in view of the new generalist nursing training, which came into force in 2020. As part of the KraniCH (*Kompetenzorientiertes und anschlussfähiges Curriculum Hannover*) project, conducted collaboratively by FH Münster University of Applied Sciences (project leaders: Professor Dr. Kordula Schneider from Münster School of Vocational Education and research assistant Dr. Heidi Kuckeland), the Nursing School of Hannover Medical School and the Vocational School for Care for the

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I. Darmann-Finck, K. Reiber (eds.), *Development, Implementation and Evaluation of Curricula in Nursing and Midwifery Education*,
https://doi.org/10.1007/978-3-030-78181-1_3

Elderly of the Johanniter-Akademie Hannover between 2016 and 2020, this research gap was addressed to the extent that an extensive vocational field analysis was carried out. The results were then used as the basis for the development of a generalist curriculum.

This article starts with a presentation of various empirical approaches that are used in qualification research in vocational education in general and approaches that are used specifically in nursing curriculum development (Sects. 3.2 and 3.3). Section 3.4 provides an insight into the KraniCH research project and the vocational field analysis that was carried out, highlighting the methods of data collection and analysis, and providing examples of some of the results gained. Following on from the vocational field analysis, starting points for the development of curricular structures are derived in Sect. 3.5. The article closes with a conclusion (Sect. 3.6).

3.2 Methods of Qualification Research in Vocational Education

Triggered by the decision of the Standing Conference of the Ministers of Education and Cultural Affairs in 1996 to firmly focus vocational education on vocational action situations, the analysis of the relationship between qualification research and curriculum development gains in importance [6, 7]. It is important "to interrelate the construction of curricula with qualification research, to search for means of methodology regarding curricula-oriented qualification research and to test these methods" [7]. Robinsohn was the first to describe this relationship. He postulated that the construction as well as the revision of curricula requires a research based elicitation of those qualifications that are necessary "to handle life situations" [8].

Qualification research focuses on identifying vocational qualification requirements [9, 10]. It is not considered to be a "renowned and permanently established research field", but a "complex of themes that is subject to a multitude of areas": curriculum research as well as vocational education, sociology of education, industrial sociology, work psychology, work science and labour market research [11]. Qualification research in work science and vocational education focuses in particular on deriving the competences that are necessary to exercise a profession and the learning processes that are required to develop these competences to construct as well as to revise vocational curricula [6]. Büchter and Gramlinger [12] describe seven tasks of qualification research in vocational education and business education. One of these tasks focuses explicitly on both the analysis and development of training concepts and the development of curricula.

Following on from the close connection between qualification research and curriculum development, the construction of curricula is based on three central principles: the situation principle, the science principle and the personality principle [13–15]. Whilst the personality principle focuses on an "educational/normative context of justification" to strike a balance between the learner's individuality/autonomy, social requirements and objective constraints, the science and situation

principles are geared to an "empirical framework of justification" [16]. Curricular processes in qualification research in vocational education as well as vocational curriculum development are in particular based on the situation principle by Robinsohn [8], as it allows for eliciting and structuring content along vocational, private and social situations and areas of activity. Curricula meet the science principle when they follow the structure inherent to the sciences relevant in each case in the selection and legitimisation of their contents. However, since, vocational education and training focus on a "balance between references to occupation and practice (work and business orientation), references to science (ensuring a high specialist level of training) and the upholding of the educational claim against functionalist reductions" [17], it does not appear reasonable to decide exclusively in favour of the science principle or the situation principle. Instead, it is essential to take equal account of both shaping principles in the curriculum development process, in an inclusive manner [15].

The development of curricula in vocational education should, according to Reetz [18] and Bader [19], start with the analysis of the vocational areas of activity and encompass three steps: the first step is based on a situation analysis focused on the objective description (by way of requirements) and the subjective description (by the individual) of occupational situations (e.g. as workplace analyses). This progresses to the identification of qualifications and is followed by the determination of curricular elements (e.g. contents, skills to be supported, learning success checks, and so on) [20]. Vocational field analysis is particularly appropriate for this purpose. When conducted as a situation analysis, it focuses on the differentiated collection of vocational areas of activity [6], enabling them to act as the starting point for curriculum development. Becker and Spöttl [6, 9] describe four levels of qualification research in vocational education, which start at different points during the examination of professions and draw on various instruments and methods of research: (1) Structure of the profession and the professional field, (2) Organizational Structure of vocational processes, (3) Competences in business and work processes and (4) Significance of the identified competences and tasks inherent to the profession. Vocational field analysis primarily implements levels 3 and 4 and requires empirical studies for empirical grounding. For that purpose, qualitative research methodology offers specific instruments, some of which are presented below.

3.2.1 The Delphi Method

Although the **Delphi method** (named after the Oracle of Delphi) has its origins in 1950s US American defence research, it is currently used in a wide range of areas, including the empirical grounding of curricula in education systems [21]. Its intention is to describe, with maximum differentiation, the consensus (and disagreement) in the opinions of different experts by conducting fully structured, written and anonymised surveys, undertaken in (at least two) cycles [22]. The objective is to map developments and trends from the findings that enable conclusions to be drawn

about the (future) shaping of vocational processes. These can then be used as the basis of curricula for vocational training. The instrument is characterised by members of the group of experts (the "Delphi panel") being shown the aggregated responses of their fellow experts from the second survey cycle onwards. This enables them to reflect on their own responses in light of the responses by the Delphi panel, to modify them and therefore come to better assessments [23]. Subsequently, a result is generated that reflects extensive expertise on a (curricular) issue.

3.2.2 Expert/Skilled-Worker Workshops

Rather than focusing on written and anonymised surveys, **expert/skilled-worker workshops** [24] rely on the direct confrontation of experts with one another. Consequently, they are subject to the influence of group dynamic processes, resulting in advantages (more differentiated, better results) as well as disadvantages (some group dynamics can hinder or prevent the intended debate). Developed in the 1990s these workshops attach central importance to working contexts, and hence the complexity of occupational work processes [6]. They involve seven to ten skilled-worker experts—characterised by distinct specialist and communication skills, and representing the entire range of tasks performed in the occupation—describing, assessing and discussing their work tasks in a workshop. In this way, characteristic working contexts become apparent. Furthermore, they identify which work tasks can or should be performed by beginners, and which can only be performed with confidence after several years of work experience [25]. This enables vocational tasks to be investigated not only in their broader context, but also to be classified in a tiered competence model.

3.2.3 Vocational Task Analysis

In contrast to the methods described above, the use of **vocational task analysis**, also created in the 1990s, requires actors to enter the field. After all, in methodological terms, they draw on a combination of participatory observation and expert interviews [26]. Vocational task analysis follows a catalogue of key questions which, as categories of analysis, focus not only on work and business processes, but also on the workplace, specific objects, tools and methods of skilled work, its organisation, as well as interfaces and requirements [26]. Since not all of the key questions of these categories of analysis can be answered by passive observation alone [27], they are complemented by surveys of the skilled workers observed. These surveys are conducted directly in the workplace or, in the event that in-depth questions are required, during the observed person's break [27]. In this way, the view of actions and events captured from the outside during observation is interwoven with the intentions and substantiations captured by the surveys [28]. The result is a differentiated documentation of the vocational work tasks of experts in the context of entire actions.

In terms of research methodology, the instruments presented draw on one (or two) method(s) that bear potential as well as limitation. Whereas surveys such as those used with the Delphi method can be used expediently to gather retrospective descriptions of experts' actions, intentions and justifications, a direct view of actions from the outside is lacking, particularly since expert action cannot always be verbalised by the experts themselves [29, 30]. Vocational task analysis addresses this issue by interlinking surveys with observation. However, it refrains from the use of discursive elements, which are deployed in both the Delphi method and in expert/skilled-worker workshops. These additionally initiated reflective processes enable differentiated insights to be gained.

What all the instruments described have in common is that they draw upon the experience of experts. Consequently, the effectiveness of those instruments is directly linked to the experts' occupational action competence and their ability to verbalise their expertise. Bearing this in mind, it is vital that experts are selected in a systematic and criteria-led way—and that appropriate experts are available in the first place.

3.3 Methods of Qualification Research in Nursing Education

With regard to nursing curriculum development, it is noticeable that there has, to date, only been sporadic use of the empirical approaches and their corresponding methods described above (see, for example, Becker [31], who uses empirical analyses of work processes and qualification requirements to develop a curriculum geared towards (geriatric) nursing; Goldberg and Cooper [32] who use the Delphi method to develop part of a curriculum geared towards advanced nurse practitioners working with older people with frailty in an acute hospital). Apart from a few, most nursing education studies undertaken in the German-speaking world use other approaches to develop curricula, since professional action in nursing can hardly be standardized and is strongly influenced by structural contradictions [33, 34].

Qualification research studies in German nursing education predominantly rely on Interviews as research method. Many of them draw on **narratives**, which are analysed using methods of qualitative social research. Wittneben [4, 35], for example, collects narratives of apprentices and the action reality they experience to derive nursing action situations for constructing learning fields. Referring on Benner [29], she draws on the Critical Incident Technique (CIT) by Flanagan [36], in which critical events that have left a lasting positive or negative impression on interviewees are reflected upon.

Darmann [37] broadens the perspective by not only collecting the narratives of apprentices, but also of teaching staff and instructors. Taking up on Klafki [38], who argues that teaching has to address "key problems of the mordern world", she identifies problematic situations in nursing practice and the conflicting requirements contained therein. Inspired by Habermas [39], she uses the nursing education heuristics developed for this purpose to identify, legitimise and evaluate educational

objectives and contents at the curricular level [40]. She systematises the findings gained in the form of key problems of the nursing profession in order to initiate curriculum development processes. Walter [41] limits herself to narratives of learners, making them an object of phenomenological consideration in order to identify and interpret the phenomena that "appear in the situation". From these, she derives the competences needed to cope with the action situation. Building on this, she develops learning situations along a structured line of action.

In contrast to the studies described above, Hundenborn and Knigge-Demal [42] refrain from empirical grounding. Instead, drawing on the concept of situation based on Kaiser [43], they determine the constituent features of nursing action situations (nursing situations), and use them as the starting point for curriculum development processes.

In summary it can be stated that there is no differentiated empirically based description of the nursing profession at this stage. To date, there is a lack of a comprehensive occupational field analysis including an extensive analysis of vocational tasks. The need for a professional field analysis also arises from the fact that generalist care training should be introduced in Germany at the start of the project. With the generalist nursing training, a new nursing profession is created which is intended to bring together the three nursing professions (paediatric nursing, nursing and geriatric nursing) that have previously existed. The need for a comprehensive vocational field analysis can be derived from the aforementioned aspects, whereby there is a particular need to determine the similarities and differences between existing occupational actions of the three different nursing professions. The KraniCH research project presented below addresses this research gap. To benefit from the advantages of the instruments presented for vocational field analysis and to compensate for their drawbacks, whilst analysing in a differentiated manner the "deep structures of the work reality", following Bauer and Grollmann [44], a comprehensive triangulation of methods is undertaken. This enables observations and interviews of experts (in line with vocational field analysis) to be combined with several expert workshops (in line with expert/skilled-worker workshops).

3.4 Vocational Field Analysis as a Conceptual Basis for Curriculum Development—The KraniCH Research Project

The KraniCH project, conducted at Hannover Medical School (MHH) between 2016 and 2020, is an example of generalist curriculum development in nursing training on the basis of a vocational field analysis. This was carried out as the first step in the curriculum development process [45], since there is seen to be very little empirical data concerning the curricula of generalist nursing training [5] and since nursing curriculum development is to be undertaken based on the inclusion of essential elements of nursing practice.

3.4.1 Conceptual Objects of Research

Two *research questions* represented the starting point of the vocational field analysis. One question was related to the work processes of nurses; the other focused on the characteristics of nursing action situations. As an all-encompassing issue, both research questions attached central importance to the aspects of similarities and differences between the three programmes of nursing training (nursing training, paediatric nursing training and geriatric nursing training) that were applicable in Germany until the end of 2019 [5]:

1. Which general activities (similarities) and special activities (differences) do nursing staff perform in different settings (e. g. cardiology, gastroenterology, oncology, nursing home, etc.) when nursing people of all ages?
2. Which similarities and differences exist in nursing action situations in the different settings when nursing people of all ages, taking into account the following aspects:
   (a) Which reasons for nursing are the basis for nursing action in the different settings?
   (b) What challenging situations[1] can be singularised in the different settings involved in nursing people of all ages?
   (c) Which conflicts[2] occur in the different settings involved in nursing people of all ages?
   (d) Which different communication patterns can be singularised during interaction in the different settings involved in nursing people of all ages?
   (e) How do care-dependent people and nursing staff experience different nursing action situations?

The *first research question* focused on the general and special activities of nursing staff, and consequently the work and business processes [49] involved in nursing. One aspect involved investigating the activities performed by nursing staff, regardless of the setting in which they work and the age group attended to. A second aspect involved determining activities that nursing staff only perform in certain settings and/or in connection with a particular age group. The objective was to integrate the common elements and the specific characteristics of the "old" healthcare occupations into a new generalist curriculum, because skilled nursing professionals will be entrusted with nursing people of all ages in different settings in the future. In

[1] Challenging situations are understood to mean demanding and complex situations that can only be handled with intense effort [46]. In this respect, the challenge may be at the emotional, communication, physical or social level. Whether the situation is experienced as a burden depends on equal measure on the competences and subjective assessment of the nursing staff.

[2] Conflicts are understood to be situations in which seemingly irreconcilable tendencies clash at the intrapsychological or interpersonal level [47]. They occur when at least one person experiences differences in perception, thought, imagination, feeling and desire to another person, hindering them from meeting their goals, decisions or needs [48]. Conflicts create considerable pressure to act and resolve those conflicts, often accompanied by the experience of stress.

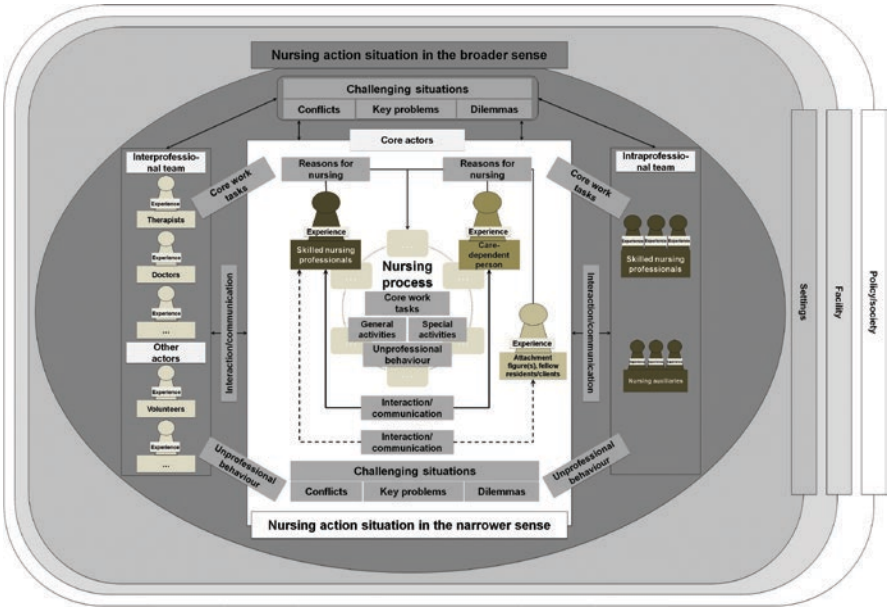

Fig. 3.1 Constituent features of nursing action situations (diagram based on [5, 50–52])

addition, the *second research question* focused on nursing action situations and the different reasons for nursing, the challenging situations, conflicts, communication patterns and the experience (of care-dependent people, of the nursing staff, etc.) as further constituent features (Fig. 3.1), in order to integrate them as overarching structures, for example, to increase complexity in the course of training [53], into the new generalist curriculum.

Figure 3.1 portrays nursing action situations and their constituent features. They are determined by different actors (such as skilled nursing professionals, care-dependent people, their attachment figures, and actors belonging to intraprofessional and interprofessional teams) and how they experience situations. A differentiation can be made between action situations in the narrower sense, which are made up of the core actors (skilled nursing professionals, care-dependent people and their attachment figures), and action situations in the broader sense, comprising actors belonging to intraprofessional and interprofessional teams. The essence of every action situation is the nursing-process-oriented action, which draws on different reasons for nursing (such as nursing phenomena, nursing diagnosis or medical diagnosis) and unfolds in core work tasks, involving general and special activities [51]. Continuous interaction and communication processes between all actors involved are another important feature of nursing action situations. In addition, some nursing action situations can be characterised by challenging situations.

These include conflicts, key problems[3] and dilemmas[4] [51]. There was no intention to investigate unprofessional behaviour within the study.[5] However, this aspect became apparent in the course of evaluating the results, and was therefore added as a constituent feature of nursing action situations. Nursing action situations are embedded in settings, facilities and society. Settings are further specifications of the different healthcare areas (such as inpatient acute and long-term care as well as outpatient acute and long-term care) at the institutional level. They are characterised by special demands placed on nurses on the one hand, and require specific nursing action on the other. Examples of settings in inpatient acute care include paediatric cardiology, stroke units and hospital-based gynaecology. Examples of settings in outpatient acute care include living quarters in nursing homes, psychiatric living quarters and paediatric short-term care. Outpatient care services, long-term care advisory centres, outpatient clinics and day hospitals are settings of outpatient acute and long-term care [5].

In our opinion, the constituent features of nursing action situations play a key role in curriculum development. It is only possible to investigate the real-world features of different action situations by conducting a vocational field analysis, enabling those features to be used not only as the basis, but also as the subject matter for curriculum development. The constituent features act accordingly. On the one hand, as the conceptual object of research under investigation and analysis [5] and, on the other hand, features of nursing action situations are also curricular starting points for the construction of learning situations into which the derived, relevant research results are integrated. Section 3.4.2 below outlines the research methodology and a selection of research results. This is followed in Sect. 3.4.3 by a presentation of curricular starting points for the construction of learning situations.

3.4.2 Research Methods

A qualitative research approach was chosen to answer the research questions. To elicit both general and special activities, as well as other features of nursing action situations, data collection involved interweaving observations and

[3] Key problems are overarching problems relating to the present and the future [38]. In the nursing context, key problems are typical and structural problematic situations [37] that always recur, that occur across areas of healthcare, and that are not bound to individual nurses, but affect a larger group of people working in that occupation [51].

[4] Dilemmas are situations arising from the value plurality of divergent requirements and individual needs [54]. They call for ethically grounded positioning [55], and are also described as moral decision-making conflicts because they are characterised by two or more options, all of which lead to an unwanted result [55]. In contrast to problems and conflicts, dilemmas cannot be resolved [51].

[5] Unprofessional behaviour in the nursing context occurs where actions or failure to act violates the knowledge of nursing science and/or reference disciplines, without professionally justifying the action or failure to act. Unprofessional behaviour is apparent in the action itself and/or in the result of the action. It results in physical and/or psychological impairment, violations of communication or neglect [52, 56].

interviews (in line with vocational task analysis) with several expert workshops (in line with expert/skilled-worker workshops) within the meaning of methodological triangulation [57].

3.4.2.1 Non-participatory Observation

To analyse the real-life nursing work context for the purpose of identifying the similarities and differences between nursing work processes, drawing on vocational task analysis [27], use was made of the method of non-participatory observation on the basis of a partially structured observation sheet [58]. Observations were undertaken by 21 members of teaching staff from the two nursing schools involved in the KraniCH project (a nursing school and a geriatric nursing school), after receiving relevant training at a one-day event. Observations lasted 4 h, and took place at various times of the day and night. They were carried out in tandem by the teaching staff—with one teaching staff member always acting as the "expert" for the relevant setting (e.g. a teacher from the field of paediatric nursing in the paediatric pulmonology setting) and another teaching staff member acting as the "non-specialist" (e.g. a teacher from the field of geriatric nursing). In another observation setting, e.g. in a shared-housing arrangement for people with dementia, one teacher from the field of geriatric nursing was present as the "expert", whereas a member of the teaching staff from the area of paediatric nursing, for example, took on the role of the "non-specialist". The intention behind classifying the participants into "experts" and "non-specialists" was to sensitise teaching staff to settings with which they were unfamiliar and to offer them an insight into those settings. Furthermore, the aim was for them to be actively included in the research process to help ensure that the results gained would indeed be integrated into teaching in the future. Observations were based on an observation sheet. These sheets, completed separately from each other by the two observers, reflected the following observation criteria:

- Reasons for nursing
- General and special activities in chronological order
- Communication patterns
- Conflicts
- Unexpected (challenging) situations
- Notes for further enquiries

Observations were conducted in a total of 43 settings. The number of observations per teaching staff member varied between one and six observations. They observed qualified nurses with a minimum of 5 years' experience in the relevant setting. The intention behind these requirements was to ensure that the nurses being observed acted professionally beyond the level of rule-governed action as described by Benner [29]. Having an additional qualification as an instructor was an elimination criterion. This was because only nursing action in the everyday working environment was the focus of the vocational field analysis, and not (at that point) the educational perspective.

Between August 2016 and March 2018 a total of 80 observation records were analysed using the coding scheme following Kelle and Kluge [59]. The large amount of data necessitated the involvement of eight specially trained people in the analysis in order to ensure continuous exchange during the evaluation process.

To take account of the inductive paradigm of the qualitative research approach, the two observation sheets from a dataset (and consequently from a setting) were initially evaluated separately. They then underwent a synoptic comparison, and were finally put into relation to the other datasets [59]. The key areas (reasons for nursing, general and special activities, communication patterns, conflicts and challenging situations) embedded in the research questions and the observation sheet set the framework for the analysis. This meant that it was possible to derive categories and subcategories for reasons for nursing, core work tasks (general and special activities), communication patterns, conflicts and challenges from the contents. Irrespective of the setting, it was also possible to observe unprofessional behaviour, which was included in the analysis as the final category.

3.4.2.2 Focused Interviews

Non-participatory observation enabled the researchers to gain access to the "view from the outside of actions and events" [28] in nursing practice. In order to additionally determine what both care-dependent people and nurses experience, and hence sound out their subjective perspectives on the meanings, intentions and evaluations hidden behind the actions and events, interviews were held with the relevant actors following observation. With regard to methodology, the researchers drew on focused interviews [60, 61] because these concentrate on a specific situation experienced by the respondents (in this case, the 4-h observations). The interviews were conducted by the observers after a break of around 30 min; in the process, the "expert" interviewed the nurse whilst the "non-specialist" interviewed the care-dependent person. The criteria for selecting care-dependent people for the interview were not only their willingness to be interviewed and prolonged contact between the nurse and the care-dependent person, but also that person's availability within the meaning of a convenience sample [23]. After gaining the respondents' consent, the interviews were recorded on tape and transcribed. By the end of the process, there were 43 interviews with nurses and 28 interviews with care-dependent people. The analysis was conducted by one person using subsuming qualitative content analysis following Mayring [62]. The statements made in the 71 interviews were initially paraphrased and generalised so as to be able to inductively form main categories and subcategories. To structure the contents further [62], the main categories and subcategories were interwoven with the results of the observations. This led to the emergence of overviews with the categories formed, representing all datasets, on all of the key research areas (reasons for nursing, general and special activities, challenging situations, conflicts and communication patterns).

3.4.2.3 Expert Workshops

In order to supplement the special activities and challenging situations investigated in the observations and surveys, two one-day expert workshops were held in

Hannover and Münster in April 2017, in which methods following Spöttl [25] and Rauner [63] were applied. Altogether, the workshops attracted 52 nursing experts [29] who had not been involved in the observations or interviews. Prior to the workshops, they were asked to describe special activities and challenging situations from their everyday working environment, using a form that was specifically designed for the occasion. A total of 36 such forms were submitted in advance. These were viewed, systematised and visualised by the researchers as a discussion basis for the expert workshops. During these workshops, the participants first spent the morning discussing among themselves in homogenous groups (experts from the field of paediatric nursing, experts from the field of nursing and experts from the field of geriatric nursing) so as to sound out the special activities in their occupational group. Heterogeneous groups were then formed in the afternoon. These groups, comprising representatives from the fields of paediatric nursing, nursing, and geriatric nursing, covering both the somatic and the psychiatric area, gathered to determine the special activities undertaken in their respective occupational group that were distinct from those in the other occupational groups. Written protocols and photographic documentation were created for both expert workshops. The results, documented in this way, were finally integrated into the system of categories derived from the observations and interviews.

3.4.2.4 Communicative Validation

Continuous validation cycles took place in the context of the study. On the one hand, these cycles were aimed at checking the consistency of the system of categories [58] and at ensuring that the contents collected had been assigned to the correct categories. To this end, the results were linked back to the teaching staff who carried out the observations and interviews, and then further processed. On the other hand, four nursing experts [29] with extensive professional experience in the areas of paediatric nursing, nursing, geriatric nursing and, in particular, psychiatric nursing who had not been involved in the research process until then were consulted in order to critically re-examine the special activities and their assignment.

3.4.3 Research Results

A diverse range of findings was obtained from the survey conducted in the context of the vocational field analysis, not all of which can be presented in detail below. One of the key results, of great importance for the curricular shaping of learning situations, is the core work tasks of nursing activities that were determined.

Core work tasks are complex tasks that are typical for a particular occupation, that account for the largest part of that occupation, and that promote occupational identity [63]. The vocational field analysis led to the determination of a total of 40 core work tasks [5]. In the framework curriculum of German the expert commission [53], action patterns are referred to rather than core work tasks. Continuous further development led to the assignment of two core work tasks to the principles of nursing, meaning that there were then only 38 core work tasks (Fig. 3.2) defined as such.

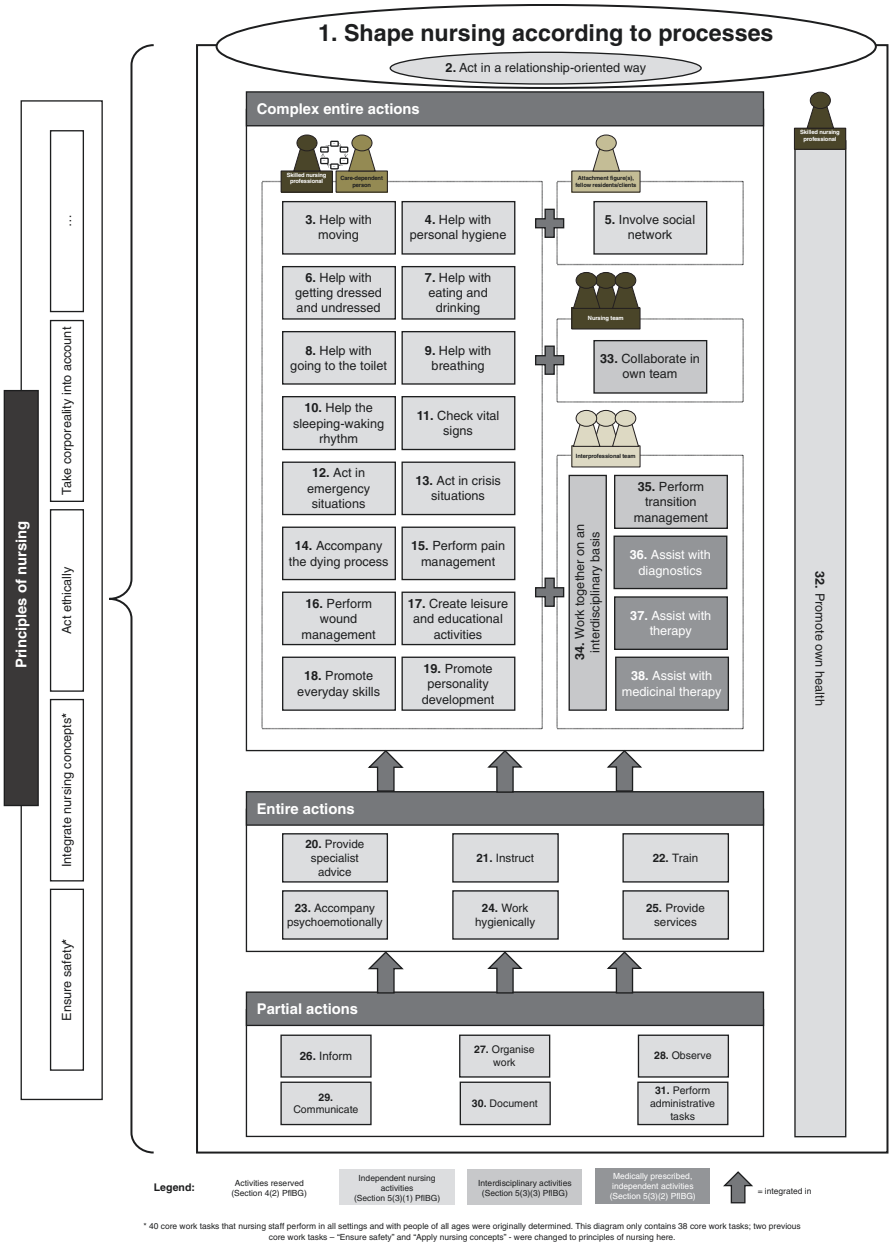

Fig. 3.2 Core work tasks of nursing activities and principles of nursing as a result of the vocational field analysis. (Contents from [5])

These core work tasks can be expanded upon by general activities and special activities [64]. A total of 992 general activities and 474 special activities were determined, with only 67 of those activities being regarded as highly special activities (2–3 settings). These results show that, overall, there are many more general activities than special activities. In addition, special activities can be assigned to different levels, depending on whether an activity occurs in one or just a few settings only (highly special) or, for example, in many settings, but only for a particular age group of care-dependent people [5]. The 38 core work tasks can be arranged on four levels (Fig. 3.2), because they exhibit different degrees of complexity. There are two overriding core work tasks that refer to and cover all other core work tasks. The first, being the most central core work task, is "Shape nursing according to processes", which, according to the new Nursing Professions Act (Pflegeberufegesetz—PflBG), is reserved exclusively for skilled nursing professionals. The second is "Act in a relationship-oriented way".

In addition, 23 core work tasks can be described as independent complex actions (e.g. "Help with personal hygiene" or "Shape transition management"), which involve other core work tasks as entire actions (e.g. "Instruct" or "Work hygienically") or partial actions (e.g. "Observe" or "Document"). The 23 complex core work tasks refer to skilled nursing professionals' work with different actors (care-dependent people, their attachment figures, nurses from the intraprofessional team and actors from the interprofessional team). Core Work Task 32 "Promote one's own health" focuses merely on individual nursing staff members (Fig. 3.2). In addition, principles of nursing such as "Act ethically", "Ensure safety" and "Take corporeality into account" also form the basis of the core work tasks, as activities undertaken by nurses (Fig. 3.2).

Besides identifying the core work tasks, the vocational field analysis was also able to determine a wide range of additional results. These include the determination of 299 different reasons for nursing, which were grouped into 71 categories and assigned to the overarching main categories of "Needs", "Nursing phenomena", "Nursing diagnosis" and "Medically prescribed activities". In addition, a total of 713 challenging situations were derived, which were assigned to the 23 overarching categories [5]. A total of 72 conflicts were determined, from which 17 categories were developed as a type of challenge facing nurses. Altogether, 627 communicative patterns were derived from the observations. These patterns were divided into three main categories—"Verbal communication with care-dependent people", "Nonverbal communication with care-dependent people" and "Verbal communication within the team"—and systematised into 71 categories. Despite having selected "expert" nurses, 224 situations of unprofessional behaviour were determined as the final conceptual key area; these situations were grouped into 17 categories.

The core work tasks play an important role in both vocational field analysis and in shaping curricula because the concrete results of the other features (reasons for nursing, challenges, conflicts, communication, unprofessional behaviour) can be assigned to the core work tasks. Table 3.1 shows an example of a selection of results concerning core work tasks. Table 3.2 contains a selection of results concerning the

Table 3.1 Examples of core work tasks featuring general and special activities

Core work tasks	General activities	Special activities (*in one or more settings*)
Observe	Observe therapeutic measures	**Observe children under phototherapy** (one setting: neonatology)
Provide specialist advice	Instruct relatives	**Provide specialist advice to women in childbed after birth on hygiene measures** (one setting: obstetrics)
Act in crisis situations	Accompany emotionally	**Provide psychoemotional support to residents moving into a residential long-term care facility** (several settings (>3): residential long-term care settings)

Table 3.2 Core work tasks with a selection of categories containing examples of reasons for nursing, challenges and unprofessional behaviour

Core work tasks	Categories of reasons for nursing	Examples
Help with going to the toilet	Nursing phenomenon: shame	Care-dependent person expresses shame following involuntary urination
Perform wound management	Nursing diagnosis: knowledge deficit	Parents do not know how their child's surgical wound needs to be cared for after discharge
Core work tasks	**Categories of challenges**	**Examples**
Help with eating and drinking	Refusal of care	A care-dependent person does not open their mouth, chokes, and refuses to drink
Communicate	Overstepping of boundaries in the behaviour of clients	Clients who become verbally abusive, insulting and offensive to nursing staff
Core work tasks	**Categories of unprofessional behaviour**	**Examples**
Help with personal hygiene	Unhygienic work	Nurse fails to change gloves, as required, after intimate care before performing skin care
Perform pain management	Care-dependent person's needs ignored	Nurse asks about pain but fails to intervene despite the care-dependent person expressing pain

other key areas—reasons for nursing, challenges and unprofessional behaviour—showing the assignment to the core work tasks in each case.

3.5 Starting Points for the Development of Curricular Structures

The curriculum development process at the school level is a highly complex process requiring a marked ability to think laterally so as to take into account the various action steps and perspectives. Following on from the results gained from the vocational field analysis, Schneider and Hamar [65] substantiate seven action steps for

the development of generalist curricula. In addition to the consideration of organisational aspects (I), such as the establishment of an overarching plan of blocks with hours, practical assignments and examinations and the clarification of the understanding of nursing and education within the team (II), the development of an overarching curricular structure (III) is an essential component of curriculum development. In the interests of reviewing and possibly adopting best practice teaching concepts from the old curriculum, a comparison is made with the previous curriculum (IV). Action Steps V–VII involve the development and ranking of individual learning situations: first of all, an overarching conceptual development of learning situations is undertaken (V), involving the definition of the elements that make up the learning situations. Then the procedure for developing the individual learning situations is determined, and documentation sheets created accordingly. However, ranking the learning situations within the three parts of the training (in the case of 3-year nursing training) is a very central aspect of this step. The penultimate action step (VI) involves the conceptual development of the individual learning situations, before the learning situation is finally developed didactically (VII).

3.5.1 Framing a Generalist Curriculum

Various starting points for the development of an overarching curricular structure (III) and starting points for the development of learning situations (V) are presented below; these are then linked to the results generated from the vocational field analysis. In the process, conceptual results from the vocational field analysis concerning the features of the nursing action situation make a significant contribution to the development of learning situations (V).

First of all, the teaching staff should determine the **type of curriculum** (tiered curriculum or spiral curriculum) and the **degree of openness of the curriculum** (open, semi-open or closed curriculum) [65]. The next step involves designing an organisational frame for each theoretical phase at the vocational school (Fig. 3.3). Besides determining which constituent aspects the theoretical phases recurrently exhibit, this involves determining which types of learning situations are to be developed and which structure-forming features they contain. One of the constituent aspects of the frame is that every theoretical phase at the vocational school (apart from the first) begins with a practical phase evaluation lasting for at least one day. In contrast, the first theoretical phase at the vocational school starts with an introductory learning situation “Starting training at school and on the job”. In addition, each theoretical phase should exhibit a specific **learning situation with regard to the core work task “Shape nursing according to processes”**, with different key areas regarding the individual nursing process steps. The aim of this element is to promote the learner’s ability to think in a nursing-process-oriented manner and to fulfil the statutory requirements stemming from the Ordinance concerning Training and Examinations for Healthcare Occupations of 2018 to cover 1000 h of the theoretical training (from a total of 2100 h) in Competence Area I (The responsible planning, organisation, development, implementation, management and evaluation

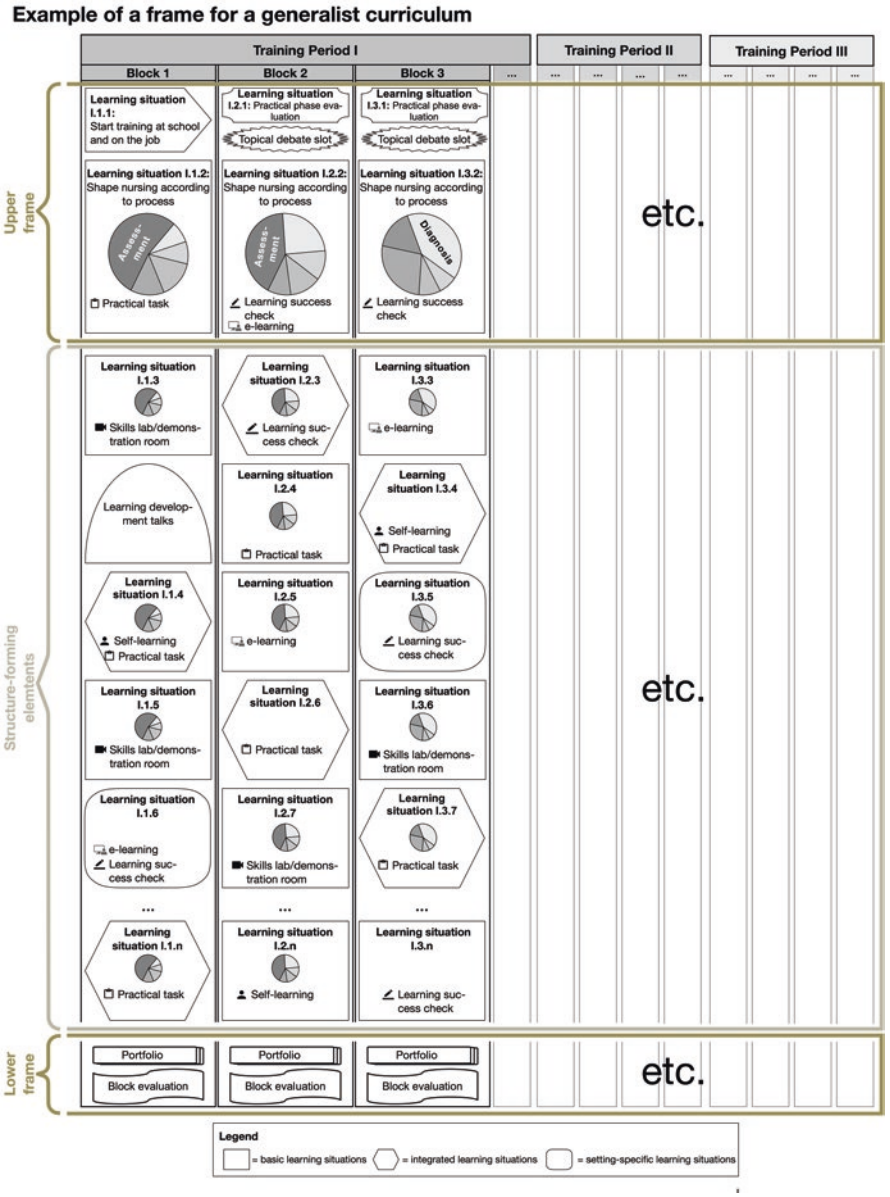

Fig. 3.3 Example of a frame for a generalist curriculum at the beginning and end of a theoretical phase at the vocational school [65]

of nursing processes and nursing diagnosis in acute and on-going care situations). Moreover, nursing-process-oriented action is also reflected in many other learning situations. The frame also contains a time window for a so-called **topical debate slot** in which current affairs are discussed and organisational aspects clarified. Time

slots for the **portfolio work** and for **block evaluation** should also be allowed for at the end of each theoretical phase at the vocational school.

3.5.2 Constituent Features of Learning Situations

After deriving the overarching frame, the next step should involve determining constituent features for the learning situation. These can be systematised on the basis of three key areas:

1. Types of learning situations
2. Structure-forming elements of learning situations and
3. Nursing science elements of learning situations.

3.5.2.1 Types of Learning Situations

There are several ways to distinguish between types of learning situations. One variant is to differentiate them into basic learning situations, integrated learning situations and setting-specific learning situations [65, 66] (Fig. 3.3). This division follows on from the core work tasks elicited in the vocational field analysis. After all, **basic learning situations** are cross-setting learning situations that refer to nursing people of all ages, whilst focusing on a core work task (example: *Help with personal hygiene*). **Integrated learning situations** are also cross-setting learning situations that focus, in contrast, on several core work tasks, principles of nursing and health disorders. Integrated learning situations can also take into account nursing people of all ages (for example: *Accompany people with neurological diseases*) or they can focus on a particular target group (for example: *Care for newborns*). **Setting-specific learning situations** also involve multiple core work tasks and principles of nursing, but in this case the main focus is on the special features of a specific setting (for example: *Accompany people in outpatient sheltered units*). Within a curriculum, there should be a basic learning situation and diverse integrated learning situations focusing on different core work tasks (Fig. 3.2). In this regard, it is not necessary, or even desirable, to address all basic learning situations first and then to progress to the integrated learning situations. On the contrary, learning situations should be combined.

3.5.2.2 Structure-Forming Elements of Learning Situations

After deciding on the types of learning situations, the next step should involve the team collaboratively determining the structure-forming elements of learning situations (Fig. 3.3), which are to be integrated into the different learning situations [65]. These include:

- Learning in the skills lab/demonstration room
- Practical tasks
- Learning success checks
- e-learning and self-learning phases
- Learning development talks

These elements should be taken into account when developing the curriculum in the 3-year training structure to be able to reserve time slots (e.g. for learning development talks in the context of learning support), but also to ensure that elements are linked appropriately to selected learning situations. For example, it must be decided which learning situations need to involve learning in the skills lab, which learning situations need to be linked to practical tasks and which learning success checks refer to which learning situations. This is determined primarily by the conceptual subject matter of the learning situation (for example, a written examination for the learning situation of "Helping people of all ages with personal hygiene" is less appropriate than a practical examination in the skills lab or demo room). In the context of promoting self-managed learning processes, it should be determined into which learning situations e-learning phases and self-learning phases should be integrated in the curriculum. Figure 3.3 shows an example of how various elements are integrated into a selection of learning situations.

3.5.2.3 Nursing Science Elements of Learning Situations

To shape the contents of learning situations, nursing science elements of the learning situations should be determined in the context of curriculum development [53, 65]. The nursing science elements include all constituent features of nursing action situations (Fig. 3.1): setting, actors, actors' experience and interpretation, reasons for nursing and action such as nursing phenomena and nursing diagnosis, core work tasks and challenging situations (conflicts, key problems and dilemmas), as well as unprofessional behaviour. In addition, other contents from nursing science and reference disciplines must be defined from the expert standards, nursing concepts, nursing theories and nursing models as well as concepts, theories and models from reference disciplines as elements of learning situations [65]. Such systematisation has a dual function: first, it acts as an overview and a corrective to the nursing science elements for the entire duration of training, ensuring that all aspects are represented and the multiple clustering of one aspect can be counteracted. Second, it offers teaching staff a structuring aid to highlight which contents and perspectives need to be taken into account in the construction of learning situations. With respect to elements, the individual learning situation can be oriented to a different key area, e.g. dilemma can act as a starting point in one learning situation, whilst nursing diagnosis or core work tasks mark the starting point in another learning situation. In addition, the different features enable the complexity of the learning situations to be increased, ensuring continuous skills development.

3.5.3 Options for Increasing the Complexity of Learning Situations

Once an overarching curricular structure and the essential elements of learning situations have been devised, 11 curricular aspects can be used to increase complexity when developing the learning situations [65] (Table 3.3). These aspects have been derived from competence development models [29, 67] as well as the framework

Table 3.3 Curricular aspects with regard to increasing complexity

Curricular aspects with regard to increasing complexity	Short description
1. Number and focus of actors	Emphasis can be placed on different combinations of actors (and the associated variety of requirements) in the course of training. Furthermore, the number of actors addressed can be gradually increased, e.g. the care-dependent person, his or her attachment figures, nursing staff, the intraprofessional team and the interprofessional team
2. Number and focus of healthcare areas	Since the nursing of people in all healthcare areas is explicitly highlighted as the educational goal (cf. Section 5(1) PflBG), all healthcare areas must be addressed at all times. However, there may be variation with regard to the proportion of time spent addressing individual healthcare areas, and also with regard to the number of healthcare areas focused on
3. Number and focus of areas of activity	According to Section 5(2) PflBG, professional nursing takes place in different areas of activity. Complexity can be elevated in the course of training by increasing the number of areas of activity focused on
4. Number and focus of nursing process steps	The significance of the nursing process as a central instrument typical to the occupation is emphasised by the new legislation. As such, it must be addressed in every block and in every learning situation that focuses on a nursing action. Options for increasing complexity exist by setting different areas of focus with regard to the individual steps, and by increasing the number of steps that take centre stage
5. Variety of health restrictions	By gradually increasing the health restrictions encountered by care-dependent people in the learning situations, an increase in complexity can be achieved
6. Demands resulting from the care degree	Complexity can be increased by focusing at the start of the training programme primarily on care-dependent people with restrictions to which no or little need for long-term care is assigned (care degrees 1 and 2), and by concentrating on primarily care-dependent people with restrictions to which a high need for long-term care can be assigned (care degrees 4 and 5) towards the end of the programme. However, in order to prepare the trainee for the real world of work, all levels of need for long-term care must be considered at all times, albeit to different extents
7. Number and focus of core work tasks	Complexity can be elevated by focusing on a modest number of core work tasks per block at the start of the programme, and progressing to a much larger number towards the end of training
8. Requirements in the core work tasks	By setting different areas of focus within the core work tasks, complexity can be increased in the course of training. For example, the core work task of “Helping with personal hygiene” can be enhanced by assisting in certain aspects of personal hygiene at the beginning, and, building on that, progressing to cover all aspects of personal hygiene. Complexity is elevated in the course of the programme in that the care-dependent person exhibits “challenging behaviour” during personal hygiene

Table 3.3 (continued)

Curricular aspects with regard to increasing complexity	Short description
9. Number and focus of principles of nursing	Complexity can be enhanced by increasing the number of principles focused on. There is also the option of increasing complexity in the course of the programme by varying the combination of different principles
10. Requirements resulting from challenging situations	Trainees come up against conflicts, key problems and dilemmas at an early stage. Bearing this in mind, such situations should be considered from the very beginning, albeit starting with a small share of such cases. Complexity can be increased in the course of training by increasing shares accordingly
11. Diversity of perspectives	Complexity can be elevated by ensuring that the trainee is confronted with a growing number of divergent perspectives and the resulting inconsistencies in the course of the programme

curriculum by the German expert commission [53]. They were subsequently fleshed out with findings of nursing science [68] as well as nursing education science (e. g [5, 37, 40]). The key objective is to increase the number of elements, e.g. actors or core work tasks, in the course of training. In addition, key areas can be determined in each case, e.g. concerning care degrees, all of which must be considered from the very beginning, but to a different extent in each case.

To increase complexity within nursing training [29, 53], the **number and focus of actors (1)** (nurses, care-dependent people, their attachment figures, members of the intraprofessional team and members of the interprofessional team) should be tiered. The more actors are involved, the more complex nursing action situations are. This aspect correlates to the **variety of perspectives (11)** among the actors: if these are convergent, the action situation is easier to manage than the situation where divergent perspectives exist. With regard to care-dependent people, complexity is increased by the **variety of health restrictions (5)** (from minor to very severe health restrictions) and the corresponding **demands resulting from the care degree (6)**. In the context of nursing action situations, complexity can be increased via the **number and focus of healthcare areas (2)** (inpatient acute care, residential long-term care, outpatient acute and long-term care) considered in the learning situations and via the **number and focus of areas of activity (3)** (health promotion, primary prevention, secondary prevention, tertiary prevention, quaternary prevention, palliation and social care). With regard to nursing core work tasks, complexity can be tiered on the one hand via the **number and focus of nursing process steps** (as the most central core work task) **(4)** (from just one process step such as assessment to the entire nursing process) and on the other hand by the **number and focus of all core work tasks (7)** and the **requirements within the relevant core work tasks (8)** (e.g. from a low level of complexity in the core work task of "Assisting with personal hygiene" to a higher level of complexity in the core work task of "Helping people in the dying process with personal hygiene". In addition, the complexity of learning situations can be increased via the **number and focus of principles (9)** and

the **requirements resulting from challenging situations** (from no challenges to conflicts and key problems to dilemmas) **(10)**.

3.6 Conclusion

Shaping curriculum development on the basis of an extensive vocational field analysis involving different research methods (in the KraniCH project in 43 different nursing settings with the use of non-participatory observation, focused interviews and expert workshops) can be described as advantageous. This is because it was possible to gain from the analysis not only detailed results for the development of learning situations, but also overarching structures as starting points for the construction of learning situations. It was possible to derive a wide range of results concerning the research questions relating to general and special activities, as well as relating to other constituent features of nursing action situations. The results included the determination of 38 core work tasks of nursing, as well as many other categorisations of reasons for nursing, challenging situations, communicative sequences and unprofessional behaviour. The core work tasks and the results concerning the other constituent features of action situations provide results on a generalist requirements profile for nursing staff. The results of the general and special activities show that healthcare occupations have more similarities with each other than differences.

In the development of a curricular structure for a 3-year training programme and the concrete development of individual learning situations, the results generated by the vocational field analysis offer numerous points of reference. Nursing action situations in the form of an overarching frame and the core work tasks represent a key focus for developing the curricular structure and constructing individual learning situations. The features for increasing complexity within the curricular structure also tie in with the action situations and their intrinsic core work tasks.

In summary, empirical qualification research is a requirement for nursing curriculum development to ensure that curricula are oriented to the real world of work and developed as a competency-based, tiered curriculum, falling back on well-grounded results generated from practice when it comes to substantiate contents.

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4 Professional Identity of Midwives as a Starting Point for Curriculum Development

Monika Kraienhemke

4.1 Introduction

The goal of a vocational training programme is to impart to students the necessary knowledge, skills and abilities required to work successfully in a profession. The basis of the programme's systematic training is its curriculum [1]. As important input for curriculum development processes the requirements, situations and tasks should be identified for which midwives must be qualified. This is the subject of so-called qualification research. Often used in an international context is the DACUM (Developing A CurriculUM) Method for identification and analysis of professional work tasks [2]. This method is criticised because it sets the decontextualised tasks as a starting point of curriculum development. In Germany, this approach was further developed from an occupation-educational research perspective. From this perspective, characteristic work situations are identified by empirical research (e.g. action-oriented specialised interviews, expert skilled worker workshops or non-participative observation), and later these are structured according to developmental logic based on theories of competence development [3]. Midwifery care is characterised by uncertainty, little potential for standardisation and contradictory requirements. Therefore, it is not sufficient to determine only situations that could be resolved with knowledge of rules. It is necessary to collect conflict and dilemma situations as well. On the basis of these situations, analysed under the perspective of competence development, students can learn to reflect and deal with the dilemmas and contradictions [4, 5].

In Germany, midwives are primary healthcare professionals who independently care for childbearing women. Medical care is needed only in special obstetric

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I. Darmann-Finck, K. Reiber (eds.), *Development, Implementation and Evaluation of Curricula in Nursing and Midwifery Education*,
https://doi.org/10.1007/978-3-030-78181-1_4

situations. In this regard, Germany is aligned with the recommendations of the World Health Organization (WHO) and the International Confederation of Midwives (ICM), both of which stress the importance of independent and comprehensive midwifery [6, 7]. This situation is largely given in the out-of-hospital setting and midwives work independently in midwifery care during pregnancy and childbirth. In hospitals independent midwifery care is limited [8]. In the clinical setting, birth is medicalised, and midwives collaborate with other health professions with physicians during delivery and with nurses during postnatal care. Here, medical professionals take the lead for all obstetric care, even when there are no special demands [9]. The ability to collaborate is a core competence not only for midwives. Successful interprofessional collaboration is associated with improved care outcomes [10]. Therefore, the promotion of interprofessional competence should be anchored centrally in training curricula for midwives. In this article a study is presented that examines how midwives currently work with doctors and nurses in everyday interprofessional collaboration in hospital. Knowledge about the demands of everyday professional work can enlighten as the profession exists today as well as it may develop in the future [11]. Findings could help to develop an educational offer to support interprofessional competence in midwifery. Recent changes to midwifery education in Germany prioritise evidence-based midwifery, woman-centred care and reflective practice [12]. The reform of midwifery training requires the design of appropriate curricula for university-level education. So far, few empirical studies exist on the professional activities of midwives in hospital. The findings presented here on the professional identity and behaviour of midwives draw attention to another aspect of curriculum design and correspond with the approach of qualification research.

4.2 Research Project

The aim of the research presented here was to explore the work of midwives with other health professionals in the clinical setting. In addition to the structures of the interprofessional work situation, midwives' attitudes about the collaboration were also of interest as presented in the following research questions:

- What structures characterise the interprofessional working situation of midwives in the clinical setting?
- What do midwives think about interprofessional collaboration with physicians and nurses?

The research process followed the grounded theory approach. Observation of midwives who collaborate with physicians and nurses in the delivery room and the postnatal ward (n = 20) gave insight into the structures of interprofessional work. Episodic interviews were used to collect data on the subjective perspective of midwives regarding the collaboration (n = 14). The subsequent analysis of the data

generated a grounded theory. The professional identity of midwives stood out in the interprofessional collaboration and was presented in the 'Theory of professional identity formation of midwives in the context of interprofessional collaboration and the medicalisation of birth' [13].

4.3 Methods

The methods of observation and episodic interview were chosen to reveal personal interactions, subjective attributions and the joint production of meaning. Observation enabled insight into everyday professional working. Interprofessional collaboration arose in joint action with subjective attributions and joint production of meaning of the participants. In addition, action in everyday situations was non-reflected and revealed social status and socialisation of the participants. Observation took place in the delivery room and the postnatal ward and focused on the interactions of the different occupational groups. The observations were recorded as field notes and then prepared as observation protocols. Ethical considerations excluded the observation of care situations with direct contact to women and families. Episodic interviews are characterised by a narrative and a guideline-based part. The narration of self-experienced episodes of interprofessional collaboration opened up a view of contextualised experiences (narrative-episodic knowledge) and provided midwives' own definitions and attributions (semantic knowledge) [14]. Midwives chose narratives with their individual main focus and the analysis reconstructed the subjective perceptions. Furthermore, narratives contained context-sensitive information of working in hospital. The guideline part of the interview focused on the research interests of this study [15]. All interview participants worked as midwives in the delivery room or the postnatal ward. Interviews were digitally recorded and transcribed verbatim.

4.4 Findings

In their daily work, midwives follow very different patterns of behaviour. In some situations, they act autonomously while collaborating with others; in others, they work in a subordinate capacity and are not required to apply their specialist expertise. The professional identity of midwives comprises three part identities: 'autonomous expert', 'part of the obstetric team' and 'medically-oriented companion of the woman'. It is important to note that the three part identities do not refer to different types of midwives, but are elements of a single identity. The part identities emerge in different everyday professional activities, ranging from autonomous and confrontation action to cooperative and integrative action and subordinate behaviour. The formation of midwives' professional identity develops from real-life work situations. The work flow in the clinical setting shapes the professional identity of midwives in various ways. At the organisational level, there are the 'fragmentation of work areas' and the 'formal transfer of medical information'. At the

personal level, the factors 'loss of competence' and 'coping with professional uncertainty' are of special interest. Professional identity formation is also influenced by medicine's authority in the clinical setting and hierarchical working relationships between professional groups. The part identities differ with regard to midwives' competence experience, field of work, guiding principle of work and relationship with the pregnant woman. Working conditions shape the professional identity of midwives in terms of everyday 'identity work' [16] and 'identity formation' [17]. Significantly, the part identities also apply to care situations in which only midwives are needed.

4.4.1 Part Identities

The identity as 'autonomous expert' is

> …the general questions she [woman who recently gave birth] has for me and of course the technical questions regarding handling and just the questions about breastfeeding. And of course, together with the woman, I find out how the child is doing, what I have to pay attention to, […] I have to check the vital signs and whether the newborn is gaining or losing weight. And this is what I figure out together with the woman…[1]

The self-image of 'autonomous expert' corresponds to the professional profile of midwifery as an independent and autonomous profession in primary healthcare. In this part identity, midwives are convinced of their specific professional competence and claim an independent field of activity. Their work is guided by the philosophy and model of midwifery care and they assume an exclusive relationship with the pregnant woman. This part identity is in line with the autonomous role of midwives laid down by Germany's regulatory framework for the profession.

Midwives with this self-image are convinced that they have expert and up-to-date knowledge of childbirth. They feel fully capable of acting independently in maternity care. They possess specialised knowledge that enables them to assess situations, differentiate physiological from non-physiological symptoms and anticipate the progress of birth. Part of their job-specific knowledge is the ability to recognise the individuality of each birthing process and provide appropriate care. Their work covers all measures that accompany and support childbirth. They collect information on the well-being of mother and child, use their own clinical judgement when making decisions and plan additional procedures and necessary interventions. In this identity, the philosophy and model of midwifery care are recognised as the guiding principle of professional activities although there are no mandatory guidelines for midwifery care in Germany. Midwives assume that pregnancy and birth are normal life events for women and in most cases do not require medical intervention. They consider the empowerment of women as an important part of health promotion and believe that women's wishes should guide care. Quiet, privacy, general surroundings and the avoidance of argument in the delivery room are of great

[1] Quotes have been edited for clarity.

importance to midwives. Another identity-forming aspect of midwifery care is the relationship with pregnant women. Midwives who believe they are 'autonomous experts' assume a special relationship with the expectant mother. This arises from midwives' specialist knowledge of childbirth, which enables them to provide appropriate care for childbearing women. Midwives believe that this relationship is particular to their profession and they derive a sense of exclusivity based on it. The special relationship gears the work of midwives to the individual situation of the pregnant woman and her family and to the long-term health effects of birth on women.

The identity as an 'autonomous expert' is a coherent construct that arises from midwives' experience of their own expertise, their area of work, the guiding principle of their work and their relationship with childbearing women. Midwives see and present themselves as capable of acting in their own work area. The 'autonomous expert' identity enables independent and self-confident midwifery care.

The identity as 'part of the obstetric team' is

> …that the doctors here take the time to come in beforehand, to sit at the woman's bed and mother her, and that it is not only my job, but it is also nice that there are doctors who care and ask the woman again, although I have already asked her, and listen to what the woman says …

Another element of the professional identity of midwives is the self-image 'part of the obstetric team'. The midwife regards herself as part of hospital obstetric care consisting of a team of physicians, nurses and midwives. The team has a shared knowledge and work area whose ethos of equal teamwork replaces the philosophy of midwifery care as the guiding principle of work. In the relationship with childbearing women, each team member becomes a contact person. The team is the everyday point of reference for midwives. The 'part of the obstetric team' identity helps midwives experience their work environment in a meaningful way.

In the obstetric team, midwifery is only one part of the needed expertise. Midwives assume that the entire obstetric team is needed to cover all the necessary skills for maternity care. All healthcare professionals must contribute their own expertise to the care of mother and child, even when there are no complications. The different forms of expertise are regarded as equally valuable and the team seeks to incorporate all points of view. The specific knowledge of midwifery is seen as one part of the team's overall expertise. Typically, hospitals lack midwife-led units. Instead, two professions—physicians and midwives—are responsible for the maternity ward. Midwives do not question the presence and activity of other professions during normal childbirth and postnatal care, even though it encroaches on their autonomy. In this identity, midwives do not see this as a shortcoming and they orient their work towards the team. Midwives greatly appreciate the interprofessional collaboration and exchange and the emphasis on equality despite the often hierarchical relationships with physicians. Although the relationship with childbearing women remains important for midwives, all professionals build a close relationship with the pregnant woman, and there is no longer an exclusive relationship between midwife

and woman. Physicians, too, care for women and forge close contacts with them and their families.

The ‘part of the obstetric team’ identity combines the experience of interprofessional collaboration and limited professional autonomy into a congruent self-image. With its emphasis on equality, the team acknowledges the importance of midwifery and enables midwives to act within the hospital’s existing structures. Midwives do not experience the lack of autonomy as a deficiency.

The identity as ‘medically-oriented companion of the woman’ is

> …if the physiological process is as it should be and mother and child are doing well in my assessment, then I would call the doctor after the woman goes into the second stage of labour, when, say, […] the baby begins to crown…

The third part of midwives’ professional identity is as ‘medically-oriented companion of the woman’. In this capacity, midwives give women a sense of security, but they leave the decision-making to other professions, usually medical doctors. Apart from organisational work, the midwife’s main task is to look after childbearing women.

In the self-image of a ‘medically-oriented companion of the woman’ midwives do not rely on the natural physiological processes of childbirth; instead, they operate within conventional medical procedures. Midwives do not practice midwifery autonomously. Nor are they responsible for obstetric situations (even routine ones). Rather, they trust entirely the skills and judgement of the physician, who makes all the final calls for each case. Midwives consult the physician and seek feedback. The constant involvement of the physician stands for a relinquishment of the midwives’ responsibility. They do not claim their own area of activity or independent expertise. The physician is present at every birth and, in the midwife’s understanding, is in charge of care. The physician makes decisions without consulting the midwife and is allowed to order a procedure contrary to the midwife’s assessment. Medical guidelines (e.g. duration of delivery, time limits for the induction of labour) shape midwifery. Moreover, midwives adopt a medical care model in which they prioritise risk thinking and cease to see pregnancy and birth as normal physiological events. They assume that the health of the woman or child could be endangered at any time even during a normal birth (‘you never know’) and thus prefer to involve the physician closely. Accordingly, midwives regard childbearing women as patients, which creates a more distant relationship between them.

This identity seems to have little in common with that of the ‘autonomous expert’. It consists of work under the supervision of medical professionals without an independent area of activity. Midwives in the clinical setting can experience their work as stressful and as a threat to their professional identity. In response to medicalised environments, midwives construct an identity that enables them to carry out a practicable form of professional practice. This identity allows them to work as dependent subordinates without regarding this as a shortcoming.

Forming various part identities helps midwives cope with different demands of autonomy and subordination while providing them with a congruent self-image.

Table 4.1 Parts of midwife identity and their comparative dimensions

	Part of identity		
Comparative dimension	Autonomous expert	Part of the obstetric team	Medically-oriented companion of the woman
Experience of competence	Independent midwifery competence	Collective obstetric competence in the team	Midwifery competence depends on other professions
Field of work	Independent field of work	Collective field of work with dual responsibility in the team	No independent field of work
Guiding principle of work	Philosophy of midwifery care	Equal teamwork	Adoption of the medical model of care
Relationship with the woman	Exclusive relationship with the woman	Part of a team for women	Regards women as patients

Table 4.1 below provides an overview of the three parts of identity and their comparative dimensions.

Little research has been done on the collaboration between midwives, physicians and nurses in hospitals. The autonomous nature of midwifery suggests that midwifery care is also autonomous in the hospital setting, but my research shows that this is not completely true. Instead, midwives exhibit a variety of behaviours in hospitals, ranging from subordinate activities to independent decision-making. An autonomous self-image cannot capture this range of behaviour in its entirety. Rather, midwives in hospital settings actively form a professional identity that accounts for these different behaviours. This identity emerges from everyday demands and situations. In the clinical setting, midwives are childbirth experts, but they are also part of an obstetric team where they are required to collaborate with others and, when necessary, to defer to physicians, who are at the top of the healthcare profession hierarchy. The identity of an independent expert cannot accommodate these different demands. Neither the collaborative work during routine childbirth nor the subordinate position under physicians corresponds to the midwife's independent self-image. The discrepancy between professional identity and everyday circumstances can be a burden. If the situation is more permanent, it is important that midwives create a 'livable' situation [17] by modifying their identity. If a midwife repeatedly experiences herself as autonomous and independently acting, an autonomous and independent identity arises. However, if she repeatedly works in a collaborative environment, her sense of professional identity changes over time (Fig. 4.1). This is why midwives construct different part identities.

Depending on the self-image and experiences of midwives, their actions at work differ. The actions they perform illustrate their professional identity and how they want to be seen by others. Keupp et al. refer to this as 'self-thematisation' [17]. Coping with working conditions depends on the experience of coherence at work.

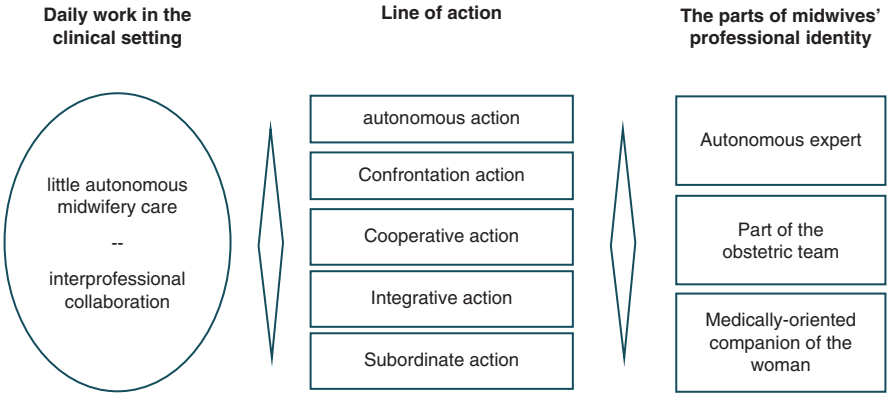

Fig. 4.1 Working conditions and the professional identity of midwives [18]. "With permission from Monika Kraienhemke (2020) Influence of professional identity of midwives on midwifery care and interprofessional collaboration, Journal of Midwifery Science, 8, Suppl.01: S29–30". (Creative Commons Attribution 4.0 International)

Long-term exposure to situations that cannot be integrated into existing professional identities can challenge or even threaten one's self-image [19], resulting in an identity crisis. By contrast, the active construction of new part identities allows midwives to incorporate a variety of experiences. The characteristics of each part identity can be different and even contradict the others, but when combined, they form a coherent whole. In this way, incompatible or otherwise frustrating aspects of professional work situations can be integrated into a single meaningful professional identity.

4.4.2 Lines of Action

The different parts of midwives' professional identity become apparent in their heterogeneous actions at work. The study's analysis identified five lines of action, ranging from autonomy to subordination.

4.4.2.1 Autonomous Action

Midwives work with a clear awareness of their professional expertise and the full scope of midwifery practice. They independently assess situations and decide themselves which procedure to perform. Professional exchange takes place exclusively with the other midwife colleagues. Midwives consider the expertise of other midwives to be adequate and they do not involve physicians or nurses in their decision-making. Midwives are responsible for accompanying childbearing women and for managing their care. They use their specialist expertise with self-confidence and take charge in their area of responsibility.

4.4.2.2 Confrontation Action

Confrontation action is similar to autonomous action. Here, too, the midwife acts independently and autonomously. The difference is that the midwife shares the duty with a physician or nurse. As two professionals are responsible for a childbearing woman, conflicting assessments and inconsistencies can arise. In the case of confrontation action, the midwife stands up for her professional convictions and does not shy away from conflict. In addition to differences of opinion, disputes regarding professional competence can also arise, but confrontations can also lead to the negotiation of a common approach.

4.4.2.3 Cooperative Action

Cooperative action is when the midwife works together with a healthcare profession from a different field, supervising each other's activities and developing a shared point of view. The common focus on the care of childbearing women enables professional exchange and the acknowledgment of different areas of expertise. Midwives believe that their skills are valued by other professionals. The mutual recognition of cooperative action facilitates reciprocal support in work situations.

4.4.2.4 Integrative Action

Integrative action considers the care of childbearing women as a common requirement for all professions in obstetrics. Distinctions between professions and areas of expertise are not apparent. Maternity care is a common requirement for midwives, physicians and nurses. In everyday work, professionals have the same tasks and areas of activity. All professions are seen as having the necessary expertise to perform maternity care. Integrative action occurs most often in the collaboration of midwives and nurses on the postnatal ward.

4.4.2.5 Subordinate Action

Subordinate action results from a workplace hierarchy where midwives defer to medical professionals, both intentionally and unintentionally. Instead of asserting their expertise and acting independently, midwives leave decision-making in obstetric situations to physicians. Especially in the delivery room they do not actively participate and little professional exchange takes place. The physician takes the lead and midwives work in an auxiliary capacity. This leads to feelings of resignation among midwives.

4.4.3 Intervening Conditions

The formation of a professional identity is shaped by various intervening conditions at the organisational and personal level. At the organisational level, identity formation is affected by the established form of work. 'Fragmented work areas' and 'formal transfer of medical information' prevent full independent midwifery care. High workloads and uncertain procedures also curtail the autonomous work of midwives. At the personal level, there are two equally important factors: 'loss of competence'

and ‘coping with professional uncertainty’. Midwives are not always able to carry out a correct and reliable diagnosis. If midwives cannot handle professional uncertainty in clinical situations, they call on experienced colleagues for help. While support from midwives promotes an autonomous identity, support from physicians usually strengthens already existing hierarchical relationships.

The different parts of professional identity and lines of action are embedded in a matrix of causes and intervening conditions. The results show a close connection between midwifery and the hierarchical working relationships in the clinical setting. The position of professions in the hierarchy—the prominent role of medical doctors, in particular—is learned and internalised during training. The increasing medicalisation of childbirth is also a relevant factor.

4.5 Discussion

The ‘Theory of professional identity formation of midwives in the context of interprofessional collaboration and the medicalisation of birth’ provides an explanation of the heterogeneous behaviour of midwives in hospitals, enabling a deeper understanding of the working situation of midwives. Behaviour of midwives that does not comport with the idea of autonomous midwifery has already been reported by several authors [20–23]. All studies describe inconsistent behaviour among midwives. The close connection between the formation of professional identity and professional life suggests that midwives have to think critically about everyday working life from the perspective of their profession. The demands on non-independent midwifery in hospitals and the need to have meaningful work nevertheless shape the professional identity of midwives. Their identity indicates that an autonomous self-image does not develop on its own over time; it requires the experience of independent midwifery.

Professional identity is an essential factor in interprofessional collaboration in obstetrics that can facilitate interprofessional relationships. Interprofessional collaboration is often useful, but it must be appropriate to the care and can therefore vary [24]. Collaboration is conceivable either as close teamwork between professional groups with equal rights or as a less close network [24, 25]. This perspective facilitates the joint work of different and autonomous professional groups. Autonomous action of midwives takes place in hospital maternity care in networks with others.

4.6 Professional Identity and Curriculum Development

The results illustrate that midwives in medically oriented clinical settings depend on creating a meaningful basis for their work. This is also true for midwifery students. Typically, they have few opportunities to experience independent midwifery care, which is oriented towards the midwifery philosophy and model of care. In addition, they lack opportunities to experience themselves as independent midwives during

training. The less one's own experience in everyday work corresponds to university curricula, the more students depend on forming an identity that coheres with the learning environment.

The influence of actual working conditions on the actions of midwives and on their professional identity collides with the educational curriculum and its goals. The ICM advocates that the philosophy and model of midwifery care be a global standard for midwifery education [26]. In addition, the ICM's document 'Essential Competencies for Midwifery Practice' shapes the expectations of midwifery education [6]. Accordingly, the learning process can be improved by a professional identity perspective:

1. ICM and WHO describe the essential skills and competences that enable independent and professional midwifery care [6, 27]. In addition to specialist knowledge and manual skills, this includes the ability to conduct conversations and shape relationships [6] when responding to the needs of pregnant women and their children [28]. Communication is of crucial importance to midwifery care. Midwifery students need to learn all essential competences to ensure autonomous midwifery practice. The experience of their own competence allows students to develop an identity appropriate to midwifery. As shown in the findings presented here, everyday working conditions promote a professional identity as a medically oriented companion of the woman instead of an autonomous expert. In this part identity, professional acting as a midwife is so much reduced, that learning all essential midwifery skills seems to be impossible.
2. Independent and comprehensive midwifery care is based on essential methodological skills. The ability to analyse situations and make well-founded decisions are general competences of midwifery [6]. Students should learn the underlying theory and apply the skills in practice. They need a learning situation in which midwives assess and decide independently. Midwife-led units are often missing in Germany and hierarchy in the clinical setting prevents autonomous decisions.
3. Providing midwifery care also depends on the ability to explain one's actions and assessments based on a solid scientific foundation [6]. Midwifery students have to learn to evaluate their own professional actions and make decisions using their own clinical judgement from the outset of their professional training. Taking a subject-specific standpoint towards others is an important way to learn these skills and to develop an identity as an autonomous expert.
4. The WHO promotes the autonomy of the midwife in health care [7], but actual working conditions in German hospitals emphasise non-independent midwifery care. Maintaining independent midwifery in close interprofessional collaboration in clinical settings is not easy to achieve. However, midwifery students need to learn the principles of midwifery philosophy and care and bring these principles to work, even when they are in non-independent settings. They should also be able to live the principles of midwifery in close interprofessional collaboration and in environments where childbirth has been medicalised. The findings presented here indicate that midwives do not always believe birth to be a

physiological process. Midwifery students need support not to ignore the physiological birth process in collaboration with other professionals.

5. Midwifery education demands practical training [26]. Internships in an identity-promoting environment are of particular importance for developing a professional identity. Students who experience independent professional midwives in practice and who learn to act independently under the guidance of instructors create the prerequisites for putting theoretical knowledge into practice [7]. Specialist knowledge and specialised on-the-job-training enable the development of an identity appropriate to the profession. Practical assignments in the curriculum are important here. On-the-job training in midwife-led units is crucial for learning in midwifery education. Students need on-the-job-training with midwives working as autonomous experts. If this is not possible, appropriate learning tasks during internships can help students reflect on their experiences. The presented parts of the professional identity of midwives could be categories of reflexion for midwifery students. Discussion about issues such as building relationships with childbearing women in independent work environments and in collaboration with other professionals can sensitise learners to the variations of midwifery care. Even if independent midwifery is not possible, the guiding principles of midwifery philosophy and care can continue. Exercises for students can be useful in this regard and maintain importance of midwifery philosophy and care.

4.7 Conclusion

The professional identity of midwives is shaped every day by work experiences. With appropriate curriculum design, midwifery education can foster the formation of an autonomous expert identity.

The care of childbearing women in the clinical setting needs equally valued expertise and midwife-led units. Midwifery research should strengthen the expert knowledge of midwives on normal birth.

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Part II

Methods and Principles of Curriculum Construction

Development and Implementation of a Competency-Based Curriculum in Undergraduate Nursing Education

5

Claudine Murararaneza

5.1 Introduction

The competency-based curriculum [CBC] is a recommended standard for educating the next generation of health professionals for the twenty-first century by the Commission of Education for the World Health Organization [1]. A CBC emphasises a self-directed and learner-centred approach to teaching and learning for the development of competencies/transferable skills, such as critical thinking, problem-solving ability, teamwork, communication skills, use of technology, and life-long learning [2]. The World Health Organization [3] advocates the implementation of a curriculum within nursing education that is evidence and competency-based, promoting life-long learning and positive health outcomes for the populations nursing graduates serve. The World Health Organization [2] defines CBC as a dynamic and flexible educational approach that accommodates health care needs, leading to the production of competent, safe and regulated professionals who can deliver quality and safe health services.

To produce competent graduates on the labour market in a vibrant and changing environment, both institutional and instructional reforms are required, according to the Commission of Education for the World Health Organization [1]. Instructional reform consists of shifting from content-based curricula to CBC that consists of searching for information, synthesising decision-making and achieving core competencies by creativity to address local priorities, rather than memorising provided information to obtain professional credentials by adopting non-critical models [1]. The same authors indicate that institutional reform consists of interdependence that involves collaboration of educational and health systems, networking of educational institutions to share teaching resources and innovations in non-hierarchical relationships with a focus on faculty development for social accountability.

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I. Darmann-Finck, K. Reiber (eds.), *Development, Implementation and Evaluation of Curricula in Nursing and Midwifery Education*,
https://doi.org/10.1007/978-3-030-78181-1_5

During the last decade, there have been significant and widespread changes to CBC in health professional education worldwide [4, 5]. The shift from traditional education to CBC has been one of the most important trends in health professional education during this time [6] as a means of optimising the preparation of health professionals for the next generation of global health workers [7, 8]. Today's curricula should address rapidly changing health needs and respond to national and international standards for the higher education sector [9]. According to [10], a competency-based curriculum is the standard of educational approaches of the European Union's directive on regulated professions including nursing. In the USA, public and private institutions are using a CBC as a non-traditional model to address the nation's needs in tertiary education for its citizens [11].

The WHO Commission of Health Professional Education advocates a paradigm shift to CBC to meet the needs of the population worldwide [1]. The World Health Organization [4, 5, 12] and the International Council for Nurses [13] recommend CBC to improve the education of nurses and midwifery, because traditional models of work and learning have proved increasingly dysfunctional for successful performance in the working environment. Employers are spending money and time on pre-service training of these graduates in the transition from school to work [14].

Investing in nursing education would help to address local, regional and global health needs and respond to changing health systems dominated by advanced technologies [15]. Nurses represent the largest category of the health professional workforce [10]. Transforming nursing education means strengthening health care systems since nurses count for approximately 59% of health professionals worldwide [15]. It has been found that CBC is a tool to close the existing gap between theory and practice in nursing education as outlined by Murarane za and Mtshali [16].

Nursing education delivered according to a competency-based curriculum is a valuable tool in transforming people's lives through the production of competent graduates and coping with changing health care systems. According to the International Council for Nurses [13], there is a need for training graduates who can provide competent and safe care to culturally diverse societies, critical thinkers, autonomous, able to evaluate knowledge and show creativity in managing and leading health services in a changing environment.

Nurses confront complex problems that require them to use critical thinking to identify the needs of the clients and implement best practices [17]. Facione [18] defines critical thinking as a complex cognitive process that uses insightful judgement by developing and utilising multiple dimensions of cognition to interpret and analyse a situation to arrive at an appropriate conclusion or solution.

In this chapter, the author focuses mainly on describing the curriculum development of CBC and its implementation by nursing schools/departments/institutions to close the gap highlighted in the literature.

5.2 Development of CBC in Undergraduate Nursing Education

5.2.1 Introduction

Developing a CBC, like other innovative curricula, is an overwhelming task. It requires careful planning with extensive involvement of stakeholders. The organisers should follow different steps to maximise the use of resources for developing proper CBC. A study conducted by Murararaneza and Mtshali [19] outlined steps involved in planning a shift to a CBC in undergraduate nursing education including (1) establishing a curriculum development team, (2) sourcing of curriculum development experts, (3) curriculum development and (4) preparation of stakeholders for a newly developed CBC.

Furthermore, a shift to a CBC must be backed by the political will of the country or region in which this change is to take place according to the Commission of Health Professional Education for the World Health Organisation [1]. There should be policies supporting the shift, including those guiding higher education institutions, regulatory bodies and health and educational departments/ministries at national and international levels. Further, it requires significant financial investment and community-based initiatives [20] compared to a traditional curriculum.

To ensure success, academic institutions thoroughly involve different stakeholders in the process of developing a CBC. This is an open task to different stakeholders of academic institutions offering nursing programs. Key stakeholders are experts [internal and external], regulatory bodies, nurse educators, graduates from nursing programs, employers and community members. The involvement of local staff, especially nurse educators, motivates them to a successful implementation of the CBC through the development of ownership and the enhanced relevance of CBC. Stansfield and Browne [21] caution that with any use of knowledge, consideration must be given to the issues of institutional responsibility, ownership and the creation of partnerships.

The CBC is a decentralised approach in education that allows the independence of educators in coordination and facilitating modules and for a school to have the curriculum reviewed and updated by its members and their collaborators [16]. For example, today nursing schools should include COVID 19 in their nursing curricula, which are competency-based, without requesting permission from higher authorities or waiting for their time frame to renew their curriculum. CBC is a dynamic process reflecting the changing realities of health professionals in an ever-changing complex and multicultural context [22].

In opposition to traditional content-based curriculum, the starting point of developing a CBC is determining expected competencies in graduates who exit the programme. CBC works on the principle of determining competencies in graduates based on health and health systems needs and building teaching and learning processes and assessments upon these competencies, as illustrated in Fig. 5.1 below.

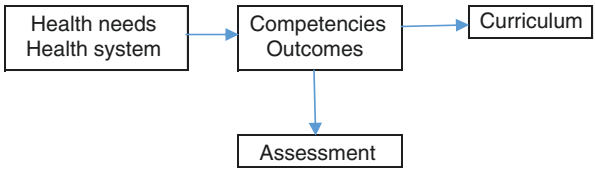

Fig. 5.1 Competency-based educational model. (Adopted from [1]))

5.2.2 Health Needs/Health System

In the health sector, there is increasing complexity and cost of health systems, placing additional demands on health workers [1]. Scientific knowledge is empowering citizens in improved care-seeking behaviour as they become increasingly conscious of their rights [1]. However, many higher education institutions are still using the traditional approach of delivering a lot of information, resulting in rote learning as the default learning outcome [6, 23]. Further, some students seek credentials solely through memorising information [1], with little or no knowledge of how to use in practice what has been learned. This was highlighted by different international organisations. According to the International Council for Nurses [13], the curricula used by many higher education institutions are inappropriate, poorly designed and overloaded, and the Commission on the Education of Health Professionals for the World Health Organisation states that the curriculum is outdated, static and fragmented [1].

To overcome the above-mentioned challenges, CBC should be developed and implemented by higher education institutions including nursing schools. This CBC approach empowers nursing students with general transferable skills that are useful in individual and professional life, such as becoming team workers, critical thinkers, life-long learners, and becoming accountable for their actions [24]. CBC addresses health/system needs through educational, research and service innovations [1].

Curriculum developers identify health/system needs through situational analysis. Situational analysis is a fundamental step for curriculum development that gives a picture of the prevailing situation [25], through the collection of accurate information from different stakeholders and resources. According to Richards [26], the different procedures used include consultation, study analysis, observation, survey and review. A careful plan and sufficient time are crucial to carry out this task to identify health/system needs within a particular context.

Furthermore, different countries are engaged in the transformation of health care systems driven by the adoption of primary health care philosophy [27] to reach health for all. The CBC addresses this issue whereby nursing students are following a community-oriented programme rather than hospital-based programmes that have been used by many nursing education institutions for a long time. With CBC, nursing students mainly do their clinical education in communities with a focus on rural [16], semi-urban and urban areas. It has been found that nurse-led primary care services lead to similar or, in some cases, even better patient health outcomes and higher patient satisfaction (Laurant et al., cited in [15]).

Today, health care systems are challenged by the extensive use of technology to provide the best quality of care worldwide. Health professionals should not be left behind in the use of these technological advancements, especially nurses who amount to the majority of health workers and who are at the front line of health care provision. In the context of undergraduate nursing education, the shift to CBC allows socialisation of nursing students with the use of technology through the process of learning and after graduation. Murararaneza and Mtshali [16] defined CBC as an educational approach that exploits extensive use of technology to enhance resources for appropriate learning and to widen access to tertiary education for nurses. With this use of technology, nursing students acquire the skills of critical analysis of information from different resources and life-long learning to make evidence-driven decisions.

5.2.3 Competencies/Outcomes

For undergraduate nursing programmes, to ensure that the programme is comprehensive, the curriculum developers consider competencies from different areas: competencies suited to all graduates from tertiary education, competencies expected in all health professionals, and those competencies specific to the nursing profession itself.

Nursing education is at the tertiary educational level, graduates are not excluded from expected competencies in all graduates from tertiary education. Those competencies are known as critical-cross field competencies such as critical thinking, teamwork, problem-solving and life-long learning. Beside, nurses graduating from an undergraduate nursing education programme are expected to have general competencies expected in all health professionals. The Commission of Health Professional Education for the World Health Organisation outlined those competencies. As published by Frenk et al. [1] health professional graduates are expected to be competent in the provision of patient-centred care, the use of evidence-based practice, the use of information technology, professionalism, and be prepared for life-long learning.

For the nursing profession, graduates are likely to be competent in (1) the provision of quality nursing care in a clinical setting, (2) leadership and management, (3) teaching and (4) basic research [14]. The clinical role is a core competency of nursing graduates at bachelor's degree level. According to Rivas et al. [28], nursing is a professional discipline with its own legal framework that uses a specific knowledge and unique perspective of the health-illness process. Nursing care in a clinical setting is achieved through a nursing process that consists of comprehensively assessing the health needs of clients using appropriate technology to make a relevant and accurate diagnosis, after which a care plan is developed in collaboration with the client and team. This is achieved through a nursing process defined as a systematic approach to nursing care using the fundamental principles of critical thinking, client-centred approaches to treatment, goal-oriented tasks, evidence-based practice, recommendations and nursing intuition [29]. The five following phases are

assessment, diagnosis, planning, implementation and evaluation [29]. The same authors indicate that assessment involves critical thinking and data collection of objective and subjective information from the patient and or caregiver. Nursing diagnosis employs the clinical judgement that leads to the planning and implementation of patient care. Planning is an essential goal for personalised care catering to an individual's unique needs. Implementation involves carrying out nursing interventions outlined in the planning phase. During evaluation, the nurse evaluates the outcomes of interventions and re-assesses patient needs depending upon overall patient conditions [28]. Further, Rivas et al. [28] found that the use of the nursing process used in a primary health care setting leads to improved health of the population.

The management and leadership role consists of managing health care unity effectively by planning, organising, supervising and evaluating the function of unity. The research role consists of collecting and analysing information on practice, teaching, managing and professional problems and developing a research proposal with the inclusion of budget. The clinical teaching role means facilitating, coaching, supervising, being a role model and assessing students/junior nurses in their clinical learning [14].

According to World Health Organization [3], nursing graduates are expected to use evidence-based practice, cultural sensitivity, working in different health care systems in their respective countries and meeting population needs, analytical and critical thinking, effective management of resources, being an advocate for patients, teamwork, community service orientation, leadership and continual professional development. Due to the impact of technology characterised by advanced rapid knowledge production, life-long learning education is becoming a focus of higher education institutions [13]. Once the curriculum development team agrees on competencies to include in the nursing curriculum from the situation analysis of a particular context, they move to the next step that consists of matching the competencies with possible modules to be taught to nursing students and then they reorganise modules for each level of the study to form a coherent programme structure.

5.2.3.1 Programme Structure

Once the curriculum development team has agreed on expected competencies in graduates for the whole programme, like a Bachelor of Nursing degree, the team proceed to the structure of the programme by determining modules and learning for each level. The CBC is made up of interrelated modules, whereby each level has defined modules to learn and the nursing student must complete and pass all modules to progress to the next level, with some modules serving as a prerequisite for others to form a coherent programme [16]. With CBC, nursing students move from learning lower-level skills to more complex high-order skills building upon previously learned skills.

The curriculum development team should be guided by the national framework that is provided by the Council for Higher Education in the relevant country. Besides, for specifically nursing programmes, the National Council for Nurses in each country indicated the number of hours for the theoretical part and hours for clinical

education. Furthermore, these standards are used to obtain the accreditation of the programme within a particular context. The framework indicates the length of the programme in credits and time to spend in order to graduate. However, a CBC itself is not time-based, but rather competent-based. Nursing students learn at different paces, therefore, they can complete the same programme at different points of time. As soon as a student masters particular learning outcomes, they are allowed to progress to the next stage.

As mentioned above, the CBC is a student-centred approach. It means that the students are given enough time to learn themselves and less time to be facilitated by nurse educators. In developing the curriculum, developers count on this principle, whereby a nurse educator facilitates mostly 40% of the student time, while 60% is for self-directed learning. Self-directed activities might be individually based or group-based discussions whereby the students work on their assignment and learn on their own to achieve expected learning outcomes. To achieve these learning outcomes, associated assessment methods and criteria must be available to students once they have registered for the modules [30].

CBC is flexible and offers elective modules to nursing students. They learn some modules known as electives outside the department/school to promote teamwork through interprofessional education. According to Maree and van Wyk [31], the interprofessional healthcare education worldwide is understood as a driving force to enhance collaboration of health professionals in order to respond to current changing health care systems. Students are given different choices depending on personal preference. The students are given explanations during orientation about the programme, to allow them to make the right choice. With CBC, nursing schools/institutions should not be standing-alone institutions [20] to allow nursing students to learn with other students from other academic departments. Therefore, networking with other education institutions to harness teaching resources and innovations with a shift from college model to university model is required [1].

5.2.4 Assessment/Monitoring and Evaluation of the CBC

Successful educational reform requires monitoring and evaluation strategies by nursing schools themselves and regulatory bodies by strengthening their accreditation to ensure the accountability of those education institutions based on the evidence [1].

Both higher education institutions and nursing councils are responsible for the accreditation of the nursing programmes. The purpose is to maintain a high quality of the developed programme and a successful implementation to produce competent graduates on the labour market. Both regulatory bodies make sure that the developed programme matches the need of the society/labour market. In this assessment, these regulatory bodies assess not only the programme but also the feasibility of its implementation and sustainability through assessing available teaching and administrative staff, infrastructure, equipment and clinical settings available to nursing students.

5.2.4.1 At an Institutional/School Level

The school/institution makes sure that the curriculum is comprehensive and updated based on health/health system needs. The CBC programme is dynamic whereby it should be regularly updated to accommodate new problems that arise in the society through training nursing students to critically analyse existing problems around them and find alternative solutions [16] based on available evidence and resources. There should be a committee in charge of this task under the direction of Academic Affairs or the Teaching and Learning Office. The committee meets regularly to discuss issues related to the curriculum in place. The members of the committee are educators and school leaders such as the head of departments and the dean, the clinical education coordinator, head of quality assurance, etc. Leaders are in a good position to adopt and implement changes when it is necessary. The World Health Organization [3] recommends nursing schools/institutions to employ nursing staff with relevant expertise in subject matter and the ability to develop and revise their programmes.

The curriculum committee gets information via feedback from key stakeholders including nursing students, educators, employers and graduates. Based on the feedback, the committee is responsible for providing recommendations/change in the curriculum to make sure that it remains relevant and updated within the context of implementation. According to Murareneza and Mtshali [24] feedback from stakeholders serves as evidence of the strengths and weaknesses of the CBC. That is why the quality assurance strategies together with student support services could be strengthened by the nursing schools/institutions. Nurse educators should be accepted as the most important stakeholder in improving the quality of education [32].

5.2.4.2 At a National Level

In nursing education, the higher education councils and nursing councils at national level assess the programmes and grant accreditation. These two regulatory bodies work hand in hand to ensure that nursing schools develop proper CBC; developed based on the needs of the population and health system of a particular country and ensure that they are successfully implementing a well-designed programme. Each regulatory body is independent and there could be a collaborative framework that clearly defines their roles to avoid unnecessary duplication in the accreditation process [24]. However, this collaborative framework is still missing in many countries, leading to a waste of resources, duplication of the same work and possible conflicts and confusions between regulatory bodies and nursing schools/institutions.

5.2.4.3 At an International Level

International health organisations, such as the International Council of Nurses and the World Health Organisation, provide guidance for curriculum developers regarding global health/health systems needs that CBC should address. For example, today's nursing curricula should be guided by the primary health care philosophy for universal coverage to reach health for all [15]. For this directive, nursing education curricula are competency-driven and community-oriented programmes rather than hospital-based programmes. Further, competency-based nursing curricula

should empower nursing students in leadership and management skills to allow them to cope with vibrant changing health care systems using evidence-driven decisions.

5.3 Implementation of CBC in Undergraduate Nursing Education

This section focuses on the practical aspect of implementing CBC within the classroom, clinical setting and skills laboratory for guidance of involved stakeholders of undergraduate nursing education. The practical guidance is outlined through conceptualising general principles of adult education or the change of learning culture with a focus on the nature of the nursing student, nurse educator, teaching and learning process, classroom and assessment of learning (see Fig. 5.2).

5.3.1 Nature of the Nursing Student

Nursing students are at the centre of the teaching and learning process, whereby they are given opportunities to learn themselves and explore their previous knowledge and experiences. Learning is optimised for adult learners when their experiences are considered during the teaching and learning process [33]. With CBC, nursing students are critical co-investigators in dialogue with colleagues and nurse educators. This was asserted by Foote [34] who states that education should liberate nursing students from passive to active learning, and consider previous experiences as rich resources of learning. Furthermore, the student-centred approach stimulates independence in learners through organised learning tasks learners encounter in everyday life [35].

CBC uses a student-centred approach in the implementation of CBC in higher education allowing two ways of communication between students and educators which enhances the students understanding and motivation [36]. Mutual respect and

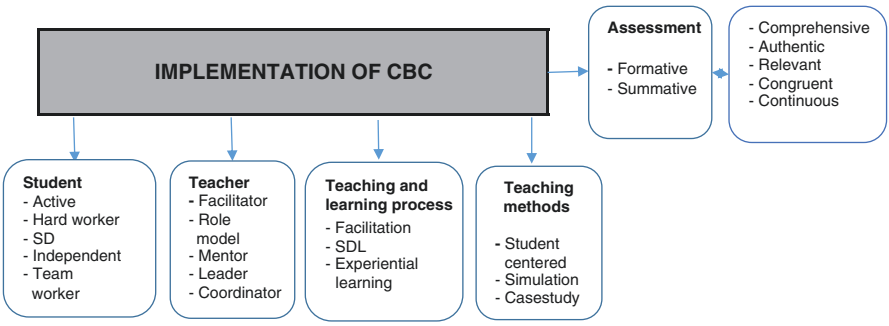

Fig. 5.2 Implementation of competency-based curriculum. (Adapted from Murararaneza and Mtshali [24])

trust have to be established to allow the students to explore, discover themselves and feel free to ask questions and offer their own opinions in a psychologically safe learning environment [37].

Self-direction and consideration of students' experiences motivate adult learners in their learning process [33]. This prevents seeing a teacher as a gatekeeper of knowledge but rather as co-creator of knowledge. Thus, CBC is also transformative by personal development [33] whereby the students become life-long learners and agents of change in their current and future working environment [24]. The nursing students become critical thinkers by seeking alternative options to solving a problem by using resources that are available to them. Autonomous and self-regulated activities enhance learning and can contribute to high-quality outcomes [38].

Active learners allow participation in classroom activities that have been carefully structured by a nurse educator [23]. The same authors mention that this enhances the relevance and improves students' motivation in their classroom activities and experiential learning environment. CBC considers the pace of learning by accommodating each learner's needs and allows more time to complete a learning task [35]. CBC allows nursing students to progress at their own pace which has been appreciated by nursing students [39]. Learning takes place through well-designed tasks but also by the way teaching is delivered, teachers' behaviour, and the rules and regulations related to the curriculum [38].

5.3.2 Nature of the Nurse Educator

Nurse educators are mainly facilitators in the implementation of CBC within undergraduate nursing programmes. They prepare learning material which might be available to nursing students once they register for the module. They ensure that they use real flexibility in planning with the students on how best to make learning relevant for each of them [40]. Nurse educators should guide the students to develop their talent and interests [41].

Nurse educators should be seen as mentors and role models to nursing students and colleagues. Nurse educators build upon their experiences and create a conducive learning environment where the students can connect to other experiences, construct personal meaning out of what they are learning and become open to a new possibility for growth [42]. This requires professional courage based on a clear understanding of how to bring a positive change and critical importance of the quality assurance process and constructive accountability [40]. The confidence of those working closely with the students is best placed to know what those students particularly need, and indeed they know best how to meet those needs so that the students achieve success [40] and enhance intrinsic motivation to learning.

A nurse educator is seen as a transformational leader for their students. This involves higher and deep interactions between leaders and followers, tapping into their leadership potential, educating them, and bringing out the best in them [32]. A teacher encourages the students the need to know, instills curiosity, builds upon prior knowledge [43]. A reflective nurse educator sees what is wrong and how it

may be improved which requires an explicit theory of teaching [43]. According to Koster et al. [38], the role of the nurse educator is to design the teaching and learning environment in a way that the student cannot escape from learning. In short, a nurse educator is an agent of change, coach, facilitator and role model; she/he needs to be open, flexible, accommodating, challenging and to motivate students to develop inquiring minds [37].

5.3.3 Nature of Teaching and Learning Process

As discussed above, CBC uses different innovative teaching strategies within classroom, skills laboratory and clinical settings. These innovative teaching methods teach nursing students how to learn themselves through seeking new information, utilise it to evaluate its importance in solving existing health problems [43]. Some innovative teaching methods, which are problem-posing driven, include group/small group discussion, brainstorming, case study, group work, student-led demonstration, etc. Nurse educators choose based on audience, the topic to be covered and the learning environment.

The problem-posing methods engage the nursing students in dialogue and the teacher becomes the coach of reflection with the students. The intuition includes the state of turning toward conscience experience that connects to the co-perceived objective background [44]. From there, the student begins to single out elements from their background awareness and to reflect upon them. The communication is characterised by horizontal relationship and collaboration between the students and nurse educator Freire [44]. The students move forward, look ahead, and learn from the past according to Freire [44]. Furthermore, the use of collaborative work and problem-solving that promote interpersonal communication enables the students to acquire leadership skills which are related to the practice of the discipline according to Reed et al. [45]. For specific nursing competencies, nursing care processes should be used as a frame of reference for all aspects of the clients, through assessment, nursing diagnosis, planning, implementation and evaluation of nursing intervention, to attend to all the client's needs rather than the sum of their parts [24].

In the implementation of CBC, tutorial sessions have been used when the students have particular difficulties that can be corrected in other ways. The tutor should not be a teacher, but someone different who should bring a fresh way of viewing the idea and detecting difficulty in students, and help in such a way without the student developing a dependence on them [46]. Many nursing schools/institutions employ senior nursing students as part-time staff for this role. To be successful, the relationship-based care characterised by mutual respect and shared decision-making is needed according to Professionalism in nursing and midwives in Scotland [47].

With CBC, the reality is not static, but rather the process of transformation. While the traditional teaching method that is dominated by lecturing ignores dialogue and treats the nursing students as the object of assistance, problem-posing

used in CBC promotes dialogue and considers it indispensable to transform nursing students into critical thinkers who later become an agent of change [44].

5.3.4 Nature of the Classroom

CBC requires change in the way the classroom is arranged in comparison to the traditional curriculum. Seating must facilitate discussion between students and the nurse educator. For example, the seats can be arranged in different small groups depending on the topic to be covered and planned teaching method. This was supported by Kovačević and Akbarov [35] who argue that rearranging the seating, incorporating the suggestions of the students about the topics to be covered and the integration of their previous knowledge and experiences into the classroom are cultures of the student-centred approach.

5.3.5 Nature of the Assessment Of Learning

Assessment of learning in CBC measures the level of achievement toward expected competencies in nursing students. Assessment must enable staff and students to engage in international contexts and debate through fostering intellectual curiosity which values and respects a range of cultural experiences and perspectives [30] at local, national and international levels. They are two types of assessment used in a CBC including (1) formative assessment and (2) summative assessment**.** The assessment of learning is mainly formative. Formative assessment is carried out during the learning process, whereby a nurse educator or student's colleagues assesses the students with a purpose of improvement by providing constructive feedback. The summative assessment is done at the end of the teaching and learning process with the purpose of decision regarding the attainment of competencies.

1. Formative assessment: Consists of supporting nursing students toward the achievement of expected competencies with a focus on constructive feedback to learners and highlighting areas of weaknesses and strengths for improvement. According to Lockyer et al. [48], timely on-going assessment is needed to ensure that students continue to progress toward the achievement of expected competencies. Further, the formative assessment indicates how the facilitation process should be adjusted [30] by the nurse educator.

   Formative assessment is time-consuming but has different benefits for both nursing students and nurse educators: (1) It helps nursing students to progress toward the mastery of expected competencies and (2) It can inform teachers about their teaching and how to adapt their day-to-day approaches to teaching strategies. With formative assessment, CBC allows nurse educators to make decisions on which teaching methods are to be used and the level of supervision needed [49]. To measure competencies in clinical education, feedback from a

mentor/nurse or educator/preceptor, objective structured clinical examination as well as simulation are good methods to be used [49].
2. Summative assessment: this assessment is conducted at the end of the teaching and learning process to make the final decision on nursing students at the end of the module or the programme. The students are assessed as to whether they have mastered expected competencies. In some countries, nursing councils use this type of assessment for theory and practice examinations that lead to the registration of new nursing graduates as registered nurses.

5.3.6 Principles of Assessment in Innovative Teaching Strategies

In a CBC, the assessment of learning could be (a) comprehensive, (b) authentic, (c) competency-based, (d) continuous, (e) relevant, (f) life-long learning and (g) congruent.

(a) *Comprehensive*: the assessment should measure different competencies expected to be mastered at a particular level of study, to solve or deal with specific health-related problems based on pieces of evidence and available resources.
(b) *Authentic or performance-based assessment*: Assessment should ideally be based in a practice context in which students will find themselves in the future, whether real or simulated. According to Mtshali [50], performance-based assessment requires demonstration of skills through creating and doing something repeatedly in a setting involving real-world applications. Authentic assessment strategies can be Objective Structured Clinical Examination [OSCE], case study, simulations or other entrustable professional activities that motivate students and prepare them for professional life [38].
(c) Assesses what the professional does in their practice, which is largely process-based professional activity, underpinned by appropriate knowledge, skills and attitudes [50].
(d) *Continuous assessment*: Assessment should reflect the learner's development from a novice to an expert practitioner and so should be developmental throughout the programme of studies [51].
(e) *Resemble professional life*: Students should begin to appreciate and experience the fact that in a professional capacity they will encounter clients, users, professional bodies, peers, competitors, statutory authorities, etc. who will, in effect, be 'assessing' them [50].
(f) *Learning*: Students should also be able to engage in self-assessment and reflection as the basis for future continuing professional development and self-directed learning [50].
(g) Between learning outcomes, teaching methods and assessment strategies [52]. Constructive alignment in teaching involves having outcomes that match activities and means of evaluating the results of learning [52].

Nurse educators make sure that they incorporate assessment methods to be used in the learning guide of the module provided to nursing students once they register the module. In the first session, more clarifications are given to nursing students regarding types of assessments that will be used to ensure that they have achieved expected competencies.

5.4 Conclusion

CBC is a valuable tool to train nursing graduates for today and the future. Its emphasis is on the competencies that are needed in graduates to respond to the needs of health care and health care systems at local, national and international levels. Key stakeholders should be part of the curriculum process to enhance relevance of the programme and spirit of ownership that increases the chance of successful implementation. Curriculum developers are guided by different policies at national level and consider the international context through use of guidance from international organisations such as the International Council for Nurses and the World Health Organization in the context of nursing education. CBC in undergraduate nursing education is accredited by both the Nursing Council and the Higher Education Council and their regulatory bodies should have a collaborative framework since they are all independent to avoid duplication and conflicts.

The successful implementation of CBC requires preparation of staff and nursing students, as well as financial investment and networking with other nursing institutions/schools. The process of implementation of CBC in classroom, skills laboratory and clinical settings relies upon a student-centred approach that uses innovative teaching assessment methods that differ to the traditional content-based programme to allow the students to develop expected competencies, such as critical thinking, problem-solving, leadership skills and to become an agent of change within the changing working environment.

Many nursing education institutions have been implementing CBC, but little information is available on the process involved in developing a programme and its implementation by schools and decision-makers at a national level. This chapter described the processes that guide nursing students, nurse educators, academic leaders and decision-makers for a successful development and implementation of a competency-based approach with a focus on nursing education.

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Backward Design for a United States Bachelor of Science in Nursing Curriculum

6

Tama Morris

There are over 4.8 million Registered Nurses (RNs) in the USA [1]. RNs comprise the largest category of nurses in the USA. A person seeking to become a RN must complete an approved program of nursing education, pass the National Council of State Boards of Nursing Licensure Examination for Registered Nurses (NCLEX-RN), and meet the licensure requirements for their state or territory of residence.

"Nursing practice requires the development of higher-level cognitive skills, values, psychomotor and technological skills, and other competencies for care of patients across settings" ([2], p. 321). Nursing education in the USA prepares the new nurse as an entry level generalist who can practice across the lifespan in a wide variety of nursing settings. As a generalist, the RN is qualified to work in areas such as maternity, pediatric, medical, surgical, mental health, and community health nursing. At the entry level, the nurse has a breadth of knowledge. With experience and graduate education, nurses focus their practice in a specialty area. This specialized practice often increases the nurse's scope of practice and may move the nurse from bedside nursing to roles at the healthcare or systems level.

Nursing programs leading to RN licensure vary in educational degrees, content, and time. The educational programs for RNs are diploma, associate degree, and baccalaureate degree programs. All three types of undergraduate programs and several graduate programs are called "entry to practice" programs, as they are the initial educational preparation for nurses prior to beginning to practice as licensed RNs.

Diploma and vocational programs, once the main form of education for U.S. nurses, are decreasing in number. Diploma programs are mostly hospital based with students completing most of their classroom and clinical work within one institution. Associate degree programs produce the highest number of entry level nurses. Associate degree programs are often located within a 2-year community college.

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I. Darmann-Finck, K. Reiber (eds.), *Development, Implementation and Evaluation of Curricula in Nursing and Midwifery Education*,
https://doi.org/10.1007/978-3-030-78181-1_6

Students complete their coursework at the college and their clinical experience at healthcare institutions. Triggered by a recommendation by the Institute of Medicine to "increase the proportion of nurses with a baccalaureate degree to 80 percent by 2020" ([3], p. 281), baccalaureate programs are increasing in number. Baccalaureate programs deliver a Bachelor of Science in Nursing (BSN) degree. The 4-year BSN programs are situated in colleges and universities. Students complete their general education and nursing coursework at the college or university and their clinical at affiliated healthcare institutions.

Although there is a common licensure exam in the USA, educational programs vary from institution to institution and from one geographic location to another. There is no national requirement for specific courses, content, or clinical hours. However, the individual states that approve nursing education programs or accreditors may have requirements for programs located in their state or territory. In some instances, multiple nursing programs may share a common curriculum. For instance, in the state of North Carolina, all public associate degree programs use a common concept-based curriculum. Baccalaureate programs in the same state are designed by the individual institutions. All nursing programs should consider the needs of their geographic location, the mission of their institution, and the ability of their student population in the design of their curriculum.

The increase in baccalaureate education in the USA is mirrored globally. As patient care becomes more complex, the population becomes more mobile, healthcare technology evolves, and the practice of nursing continues to expand from the hospital to the community, the need for baccalaureate prepared nurses who can address worldwide standards continues to increase [4]. Globally, many countries are transitioning nursing education from vocational programs to baccalaureate education models. Sigma Theta Tau, the International Honor Society of Nursing [5], is composed of members with baccalaureate and graduate education. In addition to the USA, chapters are located across the globe in countries including Australia, Brazil, Canada, Hong Kong, Japan, Lebanon, the Netherlands, South Africa, and Tanzania. Sigma reports "nurse leaders from Chile, China, Costa Rica, Denmark, Finland, India, Ireland, Israel, Germany, New Zealand, and Spain have expressed interest in establishing chapters in those countries" ("Membership" section). The organizations' growth in membership indicates the global growth of baccalaureate and graduate education. Like U.S. nursing programs, baccalaureate programs across the world must address local, national, and global standards.

6.1 Defining Curriculum

When envisioning the curriculum design process, it is important to first establish the meaning of the word curriculum. The Oxford University Press [6] defines the word curriculum as the "subjects comprising a course of study in a school or college." Synonyms include program of study and educational programs. For the purpose of this chapter, a nursing curriculum is viewed as the program of study from the time a student begins their nursing courses to graduation. Depending on the type of RN

program, the full degree requirement could be more extensive than the nursing curriculum. For instance, in a baccalaureate program, the nursing curriculum exists within a university curriculum that may include additional general education requirements, select university requirements, nursing pre-requisite courses, and elective courses. The Commission on Collegiate Nursing Education [7] requires that the baccalaureate curriculum "build on a foundation of the arts, sciences, and humanities," which are part of the broader college or university education.

The process of curriculum design is undertaken when a new nursing program is requested or when an existing program undergoes a curriculum review. A review and revision may be triggered by changes in healthcare, regulatory or accreditation revisions, existing program performance, or changes in curricular requirements of an institution. Although a curriculum can be designed by a single individual, the process is often undertaken by a committee of program faculty. The Accreditation Commission for the Education of Nurses ([8], p. 4) standards and criteria for baccalaureate education state, "The curriculum is developed by the faculty and regularly reviewed to ensure integrity, rigor, and currency." Similarly, the Commission for Nursing Education Accreditation ([9], p. 29) requires a "systematic and ongoing review and evidence-based revision of the teaching, learning, and evaluation strategies by the faculty within a culture of continuous quality improvement to foster achievement of the program's expected student outcomes."

6.2 Backward Design

Backward design is a common method of curriculum design in nursing education. Backward design begins with the end in mind. In other words, the outcomes of the program are designed first and then the curriculum is designed backward from the outcomes to the content. The process initially seems counterintuitive to those who construct a content focused curriculum, starting with a list of topics they believe the students need to learn or courses the students need to complete. Although both methods appear to be linear processes, both are reiterative and at times convoluted according to the faculty members building the curriculum. Backward design changes the paradigm from a "content-centered course to a learning-centered course" ([10], p. 329).

There are multiple advantages to backward design for nursing education. Backward design is a broad and flexible process that can assure alignment with regulatory and accreditation standards. Nursing education in the USA is regulated by the individual state or territory in which the program is legally located, with many programs earning additional accreditation from a national accrediting body specializing in nursing education. Constructing a nursing curriculum with backward design will assure that graduates of the program meet learning outcomes. However, backward design is flexible enough to incorporate many of the other elements the designer needs to consider. These include the program educational or theoretical model, mission and values of the parent institution, and the academic ability of the program's student population.

The backward design process can be scaled up for whole program design or scaled down for individual course design within a curriculum, to continuing education programs, and to specific topics or content areas within a curriculum. It can be used with curricula designed around major content areas such as those historically considered to be the medical model, an integrated curriculum, or a conceptual curriculum. Programs can be scaffolded, designed in levels, or designed modularly. Backward design produces a clear curriculum map that demonstrates the plan for student learning, from entry to the program through graduation. The design process lends to development of the program evaluation plan in conjunction with the development of the curriculum. During implementation, backward design eliminates curriculum drift that can often happen when individual faculty or organizations advocate for local or personal preferences in the curriculum and helps to prioritize information that students must learn over information that is interesting but does not necessarily lead toward student achievement of the program student learning outcomes.

6.3 The Process of Backward Design

Backward design is described by Wiggins and McTighe as a three-stage process, consisting of identifying the desired results, determining acceptable evidence, and planning experiences and instruction [11]. Each step in the construction process creates a framework that will bring clarity and continuity for students, faculty, and evaluators.

In the first stage, identifying the desired results, faculty consider multiple elements for the nursing program. The elements may include the stakeholders, geographic location of the program, the parent institution for the educational program, and the characteristics of the learner. This first stage is initially broad and requires designers to bring multiple disjointed elements together. The purpose of the first stage is to develop the program outcomes that graduates will achieve at the completion of the program.

In the second stage, the developers determine the evidence required to establish that graduates have met the learning outcomes. The focus at this stage remains on observable, measurable artifacts or behaviors. Evidence may come from three primary areas. They are the didactic instruction, labs including simulation, and clinical experiences. This step is crucial to establishing the curriculum evaluation plan in conjunction with developing the curriculum.

The third stage is what educators are most familiar and comfortable with. In this stage faculty select strategies for teaching techniques, materials, and resources to achieve the established learning outcome. This stage is closest to the student and the heart of the teaching learning process.

Although backward design is described here as related to curriculum design, the overall process should be familiar to nurses and echoes the steps of the nursing process. Designers will recognize assessment, planning, intervention, and evaluation in the various stages. When designers begin to think through the stages using

the nursing process with which they may be more familiar, the design process will become clear within the context of student nurse education.

6.4 Stage I: Identifying Desired Results

The first stage of backward curriculum design is identifying the student learning outcomes by assessing what needs to be considered for the specific curriculum. At this stage, program designers begin by thinking broadly about factors that impact the program. Factors include stakeholders, regulatory and accrediting organization standards, information from leaders in the nursing and healthcare industries, and resources. Significant decisions are made in this step to establish what is required and must be done, what can be done with available resources, and what may distinguish the specific program from other nursing education programs. Nursing students in the USA can select from programs throughout the nation; therefore, programs strive to establish a specific identity and results to appeal to prospective students.

6.4.1 Stakeholders

The designer must consider and define the program stakeholders. A stakeholder is one who could benefit, or conversely be harmed, by a program, process, or organization. These may include the population of prospective students, the educational institution, and the community in which the students learn. Identifying the stakeholders helps to determine unique needs that must be considered in the design process.

When considering student characteristics, a program must consider where their applicants are drawn from and their academic ability upon entering a program. For instance, some curriculums are designed to admit students directly from high school, while others require students to complete 1–2 years of higher education before beginning their nursing education. This difference in the populations will drive the design of the curriculum related to foundational knowledge the new nursing student is expected to understand when beginning nursing courses. Nursing programs may also be designed for specific populations. For instance, Northern Arizona University offers the American Indian Nursing Program. This reservation-based program "serves the healthcare needs of native peoples in reservation settings and adjacent communities" [12].

The parent institution where the nursing program is offered is a stakeholder. Each institution has a philosophy of education that programs will be expected to fulfill, and the nursing program will reflect that philosophy. For example, a program in a religiously affiliated institution may require students to complete courses specific to that religion. An institution with a study abroad requirement may require that the nursing program build and manage nursing related experiences outside of the USA. The parent organization will provide resources for the educational

program. Resources and financial support may impact the number of faculty in a program, the laboratory and simulation facilities available to the program, and the student support services that are provided.

The community in which the program is located may impact curriculum decisions. The healthcare organizations in the community provide the location for clinical experiences and often hire many of the graduates of the program. Therefore, strong partnerships form between the healthcare systems as a stake holder and the nursing programs as the educator of the emerging workforce. Specific concept or content may be incorporated in the curriculum to "reflect the values and culture of the community" ([13], p. 50).

6.4.2 Regulatory and Accrediting Standards

To be eligible for licensure in the USA, nursing students must graduate from a program that has been approved by a Nursing Regulatory Body [14]. "Nursing Regulatory Bodies are jurisdictional governmental agencies in the 50 states, the District of Columbia and four U.S. territories that are responsible for the regulation of nursing practice" [15]. The requirements established for nursing education may be part of the individual state or territory's regulatory code or laws. To gain initial and on-going program approval, nursing programs are required to show evidence that their curriculum complies with the regulations.

Twenty-three states, two territories, and the District of Columbia require nursing programs to acquire national nursing accreditation [14]. In the remaining states and territories, many programs voluntarily seek accreditation. Accreditation establishes value for a program as it verifies a recognized level of quality review. Students may need to attend an accredited program to receive financial assistance during their education [16]. Accreditation standards include elements such as alignment with the institutional mission and values, adequacy of faculty, student and curriculum criteria, demonstration of an on-going program evaluation and achieving established program outcomes, including graduation rates and success on licensure examinations [7–9]. In addition, there may be specific curriculum requirements, such as the American Association of Colleges of Nursing *Essentials for Baccalaureate Education for Professional Practice* [17]. Specifically, U.S. nurses are required to be educated to care for clients across the lifespan. Therefore, "lifespan" becomes a critical concept or competency within the curriculum. Another example may be cultural knowledge, competency, or responsiveness.

6.4.3 Leading Organizations in Nursing and Healthcare

In addition to regulatory and accrediting documents, program designers must be aware of key organizations in nursing and healthcare that may shape nursing education and practice. For instance, in the USA, nursing curricula uphold and teach the *Code of Ethics for Nurses* [18]. Another key organization is the Quality and Safety

Education for Nurses (QSEN) Institute. QSEN is recognized for the development of competencies encompassing the required knowledge, skills, and attitudes to create a safe practice environment for patients and nurses [19].

6.4.4 Resources

A critical component of curriculum design is to establish what resources are available and possible resource constraints. This often-forgotten step can have a major impact on successfully delivering a curriculum as planned and many nurse educators may not be well versed in integrating budgeting into the curriculum building process.

Resources include a variety of elements, including availability of clinical sites, qualified faculty, full and part-time faculty positions allotted by the parent institution, student support services, and physical space for student learning experiences. A program that designs the curriculum to rely heavily on simulation will need a well-developed simulation center with high fidelity equipment and faculty certified to teach in this environment. Another factor may be the geographic location of the institution. Rural institutions may have decreased access to hospitals for clinical but could have greater access to community sites. Therefore their curriculum may emphasize community-based learning instead of clinical experiences in an acute care setting.

6.4.5 Building the Curriculum Framework

After a comprehensive assessment of stakeholders, regulatory and accreditation requirements, industry leading standards, and resources, the designers must synthesize the information and determine major and minor concepts for the curriculum. The major elements are generally broad concepts and lead to the planning of student learning outcomes for the graduates "Current accreditation criteria for higher education in general and nursing in particular focus on evidence that the nursing education program is producing important intended outcomes of learning." ([2], p. 21).

In education, program student learning outcomes (PSLOs) may be more commonly known as goals, terminal goals, or objectives. The purpose of a PSLO is to establish what a graduate of the program is capable and competent of at the completion of the program. It is not unusual to find that PSLOs are reviewed and revised multiple times as the curriculum process continues, and cross-checks are performed. Cross-checking assures that concepts are introduced, developed, and evaluated at an appropriate and consistent pace across the curriculum. It also assures that repetition is minimal and strategic.

There are several common errors at this stage of program design. One is the development of a large number of PSLOs. This often occurs because there has been inadequate synthesis of the items assessed in stage one. At times, PSLOs are

included due to faculty interest instead of graduate expectations. The problem of too many PSLOs may be resolved by identifying common elements in the proposed PSLOs, combining, or eliminating PSLOs. The second error is establishing PSLOs that apply to an experienced, practicing nurse. In the USA, nursing education prepares graduates as generalists at the entry-to-practice level. Therefore, it is important to consider what a new graduate needs to achieve and not how an experienced nurse would perform.

Once the PSLOs are designed, a curriculum framework begins to develop. The framework is a representation of the how elements within a curriculum come together. The framework may be entirely created by the design committee or programs may select a theorist or theoretical model for their curriculum framework and develop PSLOs that align with the selected theory.

Minor or sub-concepts may be incorporated into the framework as lower level or course student learning outcomes, or as thread in the curriculum. Whereas PSLOs tend to be distinct ending points, a thread is woven throughout the curriculum and evident in multiple or all courses. Common examples of nursing curriculum threads are diversity and inclusion or the concept of caring.

As the framework develops, the courses within the framework become evident. The designer begins to consider building blocks to help a student achieve the PSLO. Questions guiding the development may be related to how to introduce a concept. After being introduced, how does the curriculum build the students' knowledge, skills, or attitudes in this content area? Where can the student apply this concept? Course student learning outcomes (CSLOs) are developed to build the student's abilities until they can achieve the PSLOs.

Development of the PSLOs is the first step of backward design. In Stage I, designers assess the educational landscape from multiple perspectives and plan expectations for their graduates. The next step is to determine how the educator will know their graduate has achieved the stated PSLOs.

Stage I Exemplar:

- High level concept: communication
- PSLO: The graduate of the nursing program will communicate and interpret communication accurately in a timely manner through a variety of methods, including verbal, digital, and written methods.

6.5 Stage II: Determining Acceptable Evidence

In stage one of backward design, curriculum designers determine what they want their graduate to achieve with the PSLOs. The second stage of backward design is determining acceptable evidence to demonstrate that the program student learning outcomes have been achieved. In this step authentic measures for the PSLOs are established. Determining acceptable evidence builds the program's evaluation plan in conjunction with the curriculum.

6.5.1 Program Evaluation Plan

An integral but often overlooked important element of curriculum design is development of the program's evaluation plan. Ideally, the program evaluation is developed concurrently with curriculum. The process of curriculum evaluation can then begin with the initiation of program delivery in an on-going manner as the curriculum unfolds. Early implementation of the program evaluation plan establishes a culture of continuous program improvement.

There are two common errors with the development and implementation of the evaluation plan. One is developing the full curriculum followed by the development of the evaluation plan, only to find challenges in evaluation, or worse yet, design flaws in the curriculum. The second is to deliver the entire curriculum to the first group of students and then begin the evaluation process. During this delayed period of evaluation, ideas are forgotten, faculty turnover results in the loss of institutional memory, and the evaluation process itself becomes overwhelming.

Program evaluation is designed concurrently with the curriculum in the backward design model. Progress toward the achievement of the program student learning outcomes is measured at various points within the curriculum at the levels of individual courses or following completion of a set of courses. For instance, if the PSLO establishes that the graduate will communicate by multiple means in an accurate manner, evaluation can take place at any time in the curriculum where students implement communication strategies. The designer determines where the concept of communication is introduced to the student in the curriculum. The designer then creates exercises or assignments to measure student performance at the introductory level. At key times in the curriculum, the students' growth in communication skills will be assessed, culminating in the measure of student performance at the end of the program that aligns with the PSLO.

6.5.2 Selection of Authentic Measures

"Assessments of students' knowledge and skill should be augmented with evidence of transferability to authentic practice environments" ([20], p. 124). Authentic assessment is important for nursing because nursing is a practice discipline. Knowledge is gained in a variety of settings, but true demonstration of the depth of knowledge is demonstrated as care is provided to a patient or population. Villarroel et al. [21] describe three dimensions of authentic assessment. They are realism, cognitive challenge, and evaluative judgment. Formal assessment may occur in the classroom, simulation laboratory, or clinical setting. Regardless of the setting, the assessment itself must represent what a graduate will practice in a clinical setting. Graduates must use higher order thinking to respond to the situation. The graduate must also be able to correctly assess their own performance for the purpose of learning.

The final step in establishing an authentic assessment measure is to design the measurement tool. This may be a rubric and can be implemented in a variety of

means. “A common approach to communicating performance criteria is through a rubric – a scoring tool that explicitly represents the performance expectations for a given assignment” ([22], p. 146). For written course work, the assessor will establish the student’s achievement based on the evaluation of students performance on items such as a reflective essay, a case study report, a written plan of care, or the student’s summary of a clinical experience. A similar process of evaluation can be completed for a performance-based assessment in the simulation laboratory or clinical setting where the instructor observes student interaction and scores the student performance on a rubric.

6.5.3 Measuring Success at the Program Level

Once authentic assessment measures are determined, the program designers need to determine the threshold for success. At the program level, the threshold is often established relative to the aggregate class performance and not that of individual students. The threshold may describe how many of the students in the graduating class were expected to achieve the recognized criteria. One example may be that 90% of the graduates achieve a score of 80 or higher on a specific assignment. Another measurement criterion may be a response to a survey. Surveys are commonly used to measure perception or items in the affective domain. For instance, 90% of the graduates indicated that activities in the simulation laboratory informed their professional values.

Stage II Exemplar:

- High level concept: communication
- PSLO: The graduate of the nursing program will communicate and interpret communication accurately in a timely manner through a variety of methods, including verbal, digital, and written methods.
- Acceptable evidence: Observational score using a rubric based on the uncertainty reduction management theory during a simulation scenario.
- Program Evaluation Threshold: 90% of the graduates will achieve a score of 80 or higher on the communication rubric as measured during the capstone simulation experience.

6.6 Stage III: Planning Experiences and Instruction

After determining the program student learning outcomes and selecting authentic measures for evaluation, the backward design process enters the third stage of planning experiences and instruction. Most faculty are generally familiar and experienced with this third stage of curriculum design. Novice teachers begin their careers with teaching assigned courses for which they plan and design instruction. Within the context of backward design, it is important that faculty planning experiences and instruction keep both the PSOLs, course SLOs, and acceptable evidence in mind. A

common error at this stage of backward design is for faculty to simply plan experiences and instruction based upon their professional experience, their clinical expertise, or following the way in which they were taught when they completed their own nursing education. These errors often focus on content and do not fulfill the intent of the curricular design.

6.6.1 Course Design

If the design of program student outcomes is at the macro level of curriculum design, faculty now plan at the course level, which can be the meso level of curriculum design. With the scalability of backward design, the same steps can be applied to design of individual courses. However, when designing course SLOs, the designers must align the course SLOs to achieve the PSLOs.

The constructivist learning theory can easily be used in backward design. From a constructivist theory perspective, many designers build their curriculum in blocks or levels indicating progressive degrees of competency or within designated periods of time such as the academic quarter or semester. According to the constructivist theory, learners understand that "knowledge is open to change as new knowledge structures are added to the existing foundational structures and connections" ([23], p. 214). Students are usually required to complete the courses in a specific sequence for the purpose of gaining foundational knowledge and building on it through the curriculum until they achieve the PSOLs, as shown in Table 6.1. "The concept of sequencing related to the vertical organization helps guide the curriculum structure so that new information and experiences are not presented until existing knowledge has been assimilated" ([24], p. 475).

Bloom's taxonomy is commonly used to design progressive course SLOs building across the curriculum as students gain knowledge and experience [25]. Use of this domain also helps to prepare the graduate for the NCLEX-RN licensure examination, which uses Bloom's cognitive domain taxonomy at the level of application or higher for questions on the examination. According to the National Council of State Boards of Nursing [26], "Since the practice of nursing requires application of knowledge, skills, and abilities, the majority of items are written at the application or higher levels of cognitive ability, which requires more complex thought processing" (p. 4).

6.6.2 Instructional Design and Strategies

After course SLOs are created, the designer then selects strategies and assignments that best prepare a student to achieve the course SLO. This is the micro level of design. Remaining true to the course SLOs keeps the instructional plan focused and eliminates extraneous material that often does not improve student success. Designers consider if the learning outcome addresses the cognitive, psychomotor, or affective domain, which will then target instructional strategies. For instance, if

Table 6.1 Program evaluation plan demonstrating vertical integration of courses

Program Student Learning Outcome: The graduate will communicate effectively in an interdisciplinary context				
Level SLO (goal)	**Measurement**	**Assessment tool**	**Outcome**	**Recommendations**
PSLO: The graduate will communicate effectively in an interdisciplinary context	95% of students achieve passing grade per clinical faculty evaluation	Senior capstone clinical performance evaluation rubric (Communication category)	99% of graduates achieved passing grade	No changes to curriculum. Continue to evaluate per annual evaluation plan
Level III: Student constructs an emergency communication plan for a community setting	95% of students achieve score of 80% or higher	Mean score of faculty and preceptor assessment of communication plan using emergency communication plan rubric	96% of students achieved score of 95% or higher	Follow-up with individual coaching sessions with students who did not achieve score of 80% or higher. Provide case studies to enhance understanding
Level II: Student provides examples of effective and ineffective interdisciplinary communication observed in the clinical setting	90% of students correctly identify effective and ineffective interdisciplinary communication	Evaluation of student clinical logs by clinical faculty using interdisciplinary communication rubric	80% of students correctly identified effective communication. Less than 50% correctly identified ineffective communication	Provide examples in class of ineffective communication and build exercises for students to correct or improve ineffective communication
Level I: Student explains multiple types of professional communication	90% of class achieves 80% or higher	Rubric for professional communication assignment	60% of class achieved score of 80% or higher. Of those scoring less than 80%, most failed to use correct medical terminology	Recommend students complete a Medical Terminology module before beginning Level I coursework

the course SLO states at the completion of the course, the student will demonstrate safe administration of an intramuscular medication, an appropriate instructional strategy would be a psychomotor learning experience in a laboratory setting where the student calculates medication volume, manipulates a syringe, selects appropriate intramuscular sites, and administers the medication in a simulated experience. This instructional strategy would be authentic and evaluated by observation of performance at multiple steps in the process. At a higher level or subsequent course, the student could repeat the same skill but with an actual patient in a clinical setting. A patient would further contextualize the skill, requiring the student to make decisions

and adjust their technique to suit the situation, such as considering the patient weight, muscle mass, and the medication being administered.

When selecting instructional strategies, it is important for the designer to go back to several key elements in stage I. Student characteristics must be considered along with student and program resources. A PSLO may be related to the concept of global health with a planned strategy of a study abroad experience to achieve this PSLO. However, students of low socioeconomic status may not be able to have the financial resources, family support, or time to complete this activity. A more appropriate activity may be an experience with a local immigrant population.

6.6.3 Assumptions and Error in Assumptions

From a logical and visual perspective, designing course objectives that align with the PSLOs and progress from the beginning of the curriculum to graduation appears to create a linear process for learning and guaranteed outcomes. However, learning is not a linear process and students learn in multiple modalities. A student may be able to score very highly on a course written examination, but not perform well in the clinical setting. Other students learn and perform well in the clinical setting, but have difficulty performing well on written examinations that cover the same concepts. Therefore, it is important to remember that the final assessment of the student's performance occurs at the end of the program. In consideration of the licensure examination, program regulatory and accreditation criteria, students must achieve an acceptable performance level in the classroom and clinical environment.

Discrepancies in student achievement from the course to the program level are indicators of a need to review and revise the curriculum. Students may not meet designated thresholds of achievement in a course but may achieve the higher-level outcome at the end of the program. This result could occur from student maturation in their role as well as learning from multiple experiences over time. However, if a majority of students struggle in a course, but achieve the PSLO, a course review is indicated, especially looking at the course SLOs, instructional design and strategies. Similarly, if students achieve the course level outcomes but are unable to achieve the PSLO, one should question the rigor and progression of the course design, strategies, and outcomes.

Stage III Exemplar:

- High level concept: communication.
- PSLO: The graduate of the nursing program will communicate and interpret communication accurately in a timely manner through a variety of methods, including verbal, digital, and written methods.
- Acceptable evidence: Observational score using a rubric based on the uncertainty reduction management theory during a simulation scenario.
- Program Evaluation Threshold: 90% of the graduates will achieve a score of 80 or higher on the communication rubric as measured during the capstone simulation experience.

- Instructional design:
  - Level I: Complete an unfolding case study in class with instructor led cuing. Score individual reflections after the experience.
  - Level II: Students complete a family teaching exercise in a community setting. Score individual performance through observation of a video recording of the teaching interaction.

6.7 Summary

Backward design is a curricular design model that begins with the end in mind but takes the learner from novice at the beginning of the curriculum to competent at the completion of the curriculum. Although the final design appears to be linear, the process to complete the curricular design requires a consistent review and cross-checking process to assure the final curricular design brings the graduate to the level of achieving PSLOs. Development with the backward design model simultaneously creates a program evaluation plan that can be used to monitor, review, and revise the curriculum from implementation through years of delivery while guiding course instruction and strategies.

Student development within a baccalaureate curriculum must include preparation for a highly mobile workforce that can practice intra- and interdependently in a global environment. Backward design is a curricular design model that can be used to transition nursing education from a vocational to a baccalaureate model of education. Backward design of nursing curricula will assure graduates achieve institutional, local, national, and global standards.

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7 Communicative Competencies in Nursing: A Situation- and Competence-Based Curriculum

Sebastian Partsch, Sabine Muths, and Ingrid Darmann-Finck

7.1 Background: Communication Training in Healthcare Professions

Communication skills are of considerable importance for healthcare professionals [1]. Effective communication can help healthcare professionals empower their patients to cope and can increase professionals' confidence in caring for their patients [2, 3]. Conversely, ineffective communication or failure to communicate can make nursing tasks and procedures difficult and decrease the quality of patient care [4–6].

Therefore, it is recommended that communication skills training (CST) should be made an integral part of nursing curricula [7]. Current German nursing education curricula do include communication content, but the amount of time, the training methods, and the content are very disparate [8]. Best practice examples for a 3-year curriculum to train communicative competence for undergraduate nursing students do not exist and there are currently just a few recommendations in literature regarding curriculum development and curriculum guidelines.

This project, funded by the German Ministry of Health in the context of the National Cancer Plan, aimed developing a curriculum for promoting communication and counseling skills in 3-year undergraduate nursing programs that is available to schools as a best practice example and can help to ensure the quality of nursing training in terms of communicative and counseling skills.

The curriculum contains a total of 60 learning situations (between 6 and 34 teaching hours) including case situations, objectives, information regarding the intended teaching and learning process, didactic commentary and additional

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I. Darmann-Finck, K. Reiber (eds.), *Development, Implementation and Evaluation of Curricula in Nursing and Midwifery Education*,
https://doi.org/10.1007/978-3-030-78181-1_7

materials. In this article, we will describe our approach for developing the curriculum and principles it embodies.

7.2 Curriculum Construction Steps

There are different methodological approaches for curriculum development in nursing and medical education [9–11]. Important steps include the definition of the superordinate educational objectives of the curriculum and the educational process, the assessment of health care needs, the assessment of the students' needs and the determination of planned competencies and objectives. These components ensure a meaningful and successful educational program. The final steps are the implementation and evaluation of the curriculum.

Our project used a German approach of curriculum development based on multiple educational theories (Fig. 7.1) [12, 13] in order to foster personal development among students. Besides functional qualifications, students should develop critical reflective competences in the course of their education. Such competences are essential because of the dependency of cared persons towards nurses and the power dynamic of nurses towards cared persons [7]. Furthermore, systemic issues in health care cannot always be solved by nursing education alone to achieve a higher quality of nursing. Fundamental changes in health care systems may be required. Therefore, nursing education should enable students to identify and analyze such problems, to recognize change needs and anticipate new solutions.

As a first step, we selected the interactive nursing didactics by Darmann-Finck as the didactic model for the curriculum [14]. This didactic model comprises three superordinate education objectives: the ability for self-determination, the ability for codetermination and the ability to demonstrate solidarity [14].

In the second step, we developed a comprehensive theoretical framework for nursing communication divided into three levels. The first level includes underlying normative assumptions, such as recognition of the particular needs of every unique

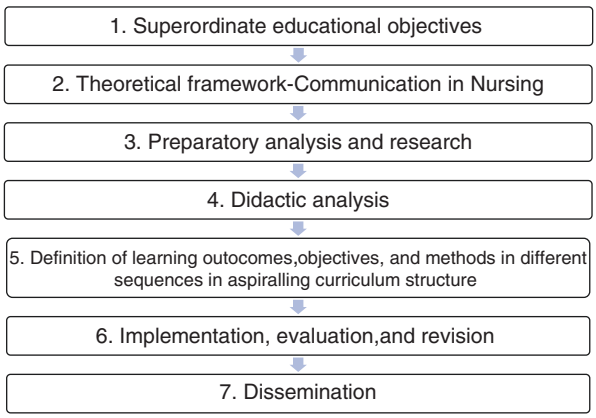

Fig. 7.1 Curriculum construction steps (c.f. [10, 12])

person to be cared for [15] or the concept of existential advocacy [16]. The second level includes communication and education theories as well as empirical studies on different aspects of nursing communication and patient education. Based on our critical assessment and the systematization of our results, we generated a differentiated catalog of communication and counseling competencies for nursing education. The third step includes three subsections: an analysis of the learning requirements in undergraduate nursing education programs, a literature review of best practice examples for teaching communicative competencies and a literature review regarding the communication needs of patients. In addition, we also identified *key problems* of professional nursing reality in communication situations [14].

The results were used to complete the theoretical framework and the catalog of competencies. Afterwards, we compared our catalog of competencies with the German training and examination regulations and the European Health Professions Core Communication Curriculum (HPCCC) [17]. Finally, we transferred the catalog of competencies into the heuristic matrix of interactive nursing didactics [14] and structured them according to their educational potentials. The fifth step, the curriculum construction, is described below. In order to review the effectivity and feasibility of the curriculum, selected learning situations were implemented by three model nursing schools and then evaluated (step 6). Besides the implementation and evaluation of learning situations, intermediate steps of the development process were regularly presented to an expert advisory board and colleagues from the model schools. The resulting recommendations were incorporated into the emerging curriculum. This approach is similar to the design-based research methodology, which is used in educational sciences to develop solutions for problems in educational practice [18]. The main characteristics of this approach are the theory-based design process and the iterative procedure [18]. Finally, the curriculum was integrated into a database especially developed for the project (step 7).

The following chapter describes the applied principles for the curriculum construction and describes how partial competencies are developed consecutively by increasingly complex learning arrangements. For this purpose, we selected one example: Interacting bodily.

7.2.1 Principles of Curriculum Construction

Our curriculum design is based on three structural principles: it is (1) situation-based, (2) follows a logical approach of competence development and (3) unifies different epistemological approaches.

1. In vocational education in Germany, situation-based curriculum construction combined with outcome (competency) orientation has prevailed in the last several decades [19]. Situation-based curricula are structured around professional tasks and situations students will encounter in their nursing practice. This curriculum structure engenders case-based and action-oriented learning. Learning

is more conducive to application if students improve competencies in the context of situations in which the competencies will be needed in actual practices. By comparison, a curriculum based on the structure of the systematic of sciences is frequently associated with receptive learning and accumulation of inert knowledge. Each module of a situation-based curriculum contains an interdisciplinary approach to different sciences. Therefore, besides communication skills, there are a number of additional competencies needed to cope in these nursing situations, such as, for example, special nursing concepts or pathological knowledge.

The team of Prof. Dr. Ingrid Darmann-Finck has supported nursing schools in the development of curricula and developed, implemented and evaluated learning situations in nursing education for several years. Besides newly developed learning situations, these already existing and proven learning situations were reviewed with regard to their nursing communication content and competency objectives, modified or further developed if necessary and implemented depending on the curriculum structure and principles.

2. In Germany, competencies are understood as person's disposition to deal with different professional situations professionally and appropriately. Therefore, competencies are acquired by acting in situations. Consequently, situation and competence orientation are closely linked.

   The following partial competencies are fostered by the curriculum:

   - Dealing with their own emotions and affects
   - Perceiving and shaping their own professional role consciously
   - Dealing with emotions and feelings of others
   - Building relationships and empathy with persons to be cared for/building relationships with social networks and families
   - Conducting formal and informal interactions (interaction basis skills)
   - Interacting bodily
   - Interacting in a biographical and life-world-oriented manner
   - Supporting persons to be cared in participatory decision making
   - Taking development phases in interactions into account
   - Countering restrictions and communication barriers
   - Understanding diversity and recognizing others
   - Understanding, reflecting and coping challenges and conflicts
   - Reflecting power and the abuse of power
   - Providing and taking information, education and counseling
   - Acting ethically

   In order to improve communicative competence consecutively and according to German training and examination regulations, we utilized the competence development model of Benner [20] in conjunction with the social sciences models of Krüger and Lersch [21] and Garz [22]. Benner [20] describes the acquisition and development of clinical competence in five stages, but only the first three stages are relevant for undergraduate student nurse training in Germany. In the beginning, students' behavior is very

inflexible, they act mostly according to guidelines and solution schemes. In the next stage, students are increasingly able to recognize recurrent meaningful components of situations and adjust their behavior accordingly. Near the end of their training, students should develop competencies to quickly recognize patterns and types of clinical situations and to modify their strategies in response to complex influences. But in this early stage, they still find solutions based on analytical thinking. After their initial training, and some years of practical experience, nurses are increasingly able to understand complex situations and develop an intuitive understanding of clinical situations [20]. This steady development of competencies is fostered by introducing increasingly complex situations and requirements in training programs, as follows:

- Simple requirements: can be solved by simple cause-effect patterns and lead to a predictable result.
- Complicated requirements: there are some complicated factors. In order to find a resolution, the sum of these factors has to be calculated, but there is still a predictable result.
- Complex requirements: characterized by many different influencing factors and their interactions. The influencing factors and the interactions between them are uncertain and the solution process cannot be determined linearly. Predicting the resolution is therefore difficult and only possible within limits [20, 23].

To create increasingly complex situations, we used the characteristics of situations by Kaiser. Kaiser [24] distinguishes action patterns and their theoretical and empirical reasons (e.g., leading admissions interviews, giving structured information or collecting biographical data), the participants and their role structure (the relationship between professionals and persons with care needs, the relationship between and among nurses and other healthcare professionals and the special characteristics of the involved participants), the purpose of the situation (e.g., care needs, other health or psychosocial needs of patients), and the context of the situation (e.g., different care areas such as long-term care, hospital, or ambulant care and their special economical and legal conditions).

We developed the situational structure of our curriculum by strategically combining different characteristics to yield different degrees of complexity within potential situations. For example, the action patterns of health promotion and health counseling or education can be combined with care needs like knowledge deficits or the desire for an improved self-management derived from a chronic disease like diabetes mellitus as the purpose of the situation and for example with a patient who does not want to accept rigorous rules. Ambulant care could be selected as the situational setting. As another example, the action pattern of care transition from inpatient to outpatient might be combined with care needs which are linked to a complex disease such as stroke or oncological illness, and, for example, fragile family coping. The situational setting would then involve the connection between hospital and ambulant care. The role may be very complicated when different professionals and different members of the family or other related persons must be integrated.

The complexity of the situation can be variegated by using complicated action patterns and a careful selection of the other characteristics or causal conditions of the situation. A communication situation becomes much more complicated if a patient exhibits challenging behaviors or is no longer able to communicate verbally, or if informal caregivers display verbally aggressive behavior toward the patient, for example, towards patients with dementia.

In order to improve also social requirements systematically, we adapted Habermas's [25, 26] and Kohlberg's [27] (developmental) theories for our curriculum. Their theories are related to the human development from child to adult in terms of social and moral competence. They understand the development of social competence as the ability of role-adoption. In course of their development, children acquire increasingly complex social expectations. Young children are not aware of social rules yet and primarily tend to their own needs. Older children are able to understand the intentions of others and adjust their actions according to that understanding. Adults can normally reflect social situations by a range of perspectives, taking the role of the so-called *generalized other*. Nursing students are already in this stage of development. Starting with their training, they are faced with new challenges and the responsibility to act in cooperation with or on behalf of another person. Therefore, further differentiation of their roles and a new interpretation of former roles is necessary [21]. With this background, the developmental logic of the curriculum follows the increasing complexity of social expectations. In the beginning, the curriculum focuses on the nursing students themselves, expanding to encompass other perspectives step-by-step. Students increasingly interact with the person being cared for and social groups (e.g., families). Later, societal subsystems should be taken into account. In addition, the complexity of social expectations increases from convergent to divergent (e.g., persons with a different socio-cultural background, persons with overburdening emotions or persons whose perceptions and experiences do not correspond to a usual understanding of reality). Additionally, students should increasingly be able to analyze restrictive conditions of the health systems and their effects on interactions.

3. The curriculum design and the learning situations are based on different epistemological approaches which underlie the didactic-methodic structure. These approaches are derived from Habermas's cognitive interests [28]. The different learning situations can include up to three epistemological approaches (Table 7.1). Learning situations which combine all three approaches are so-called *key problem situations*. The key problem situations constitute a multiperspective, critical constructive and reflective situation that nursing students are likely to encounter. In the course of the training, there are different didactic-methodic learning situations for different partial competencies.

Table 7.1 Didactic-methodological structure

Epistemological approaches	Didactic-methodic dimensions
Deduction	
Explaining phenomena and problems of the involved persons and the institution, developing solutions for rule-based communication, and counseling on the basis of theoretical and empirical knowledge	Learning situations referring to teaching problem-solving competencies/cognitive skills and/or learning situations referring to training in rule-guided practical skills
Interpretation	
Understanding the interests, motivations and feelings of the involved persons and of different groups on the institutional and social level, clinical judgment, decision making and communicating/educating in concrete situations	Experience-based learning situations referring to an acquisition of personal and social competencies
Reflection	
Uncovering and deeper understanding of personal, social and institutional discrepancies, as well as discrepancies regarding professional action	Learning situations referring to a critical reflection on interrelations and/or learning situations referring to all three approaches (so-called *key problem situations*)

For example, we added a *key problem situation* early in the curriculum to foster communication with persons in the beginning phase of dementia. This curriculum unit includes sequences in which students learn the basics of the clinical picture and the care needs of persons with dementia (e.g., disturbed thinking processes, chronic confusion, challenging behavior). Using the case of a woman who enters a nursing home, the students acquire knowledge about the relocation stress syndrome. They also develop alternative interpretations of the women's behavior on the basis of a documentary film. Furthermore, the students participate in role-play in order to practice communication strategies. Finally, in an integrative class discussion, they reflect on the internal contradictions of the woman with dementia as that between the desire for autonomy and control over her own life and the awareness of increasing loss of orientation and its emotional effects.

7.2.2 Selected Example: Courses of Development of Partial Competencies

Competency developmental-lines can be illustrated for different partial communication competencies in the curriculum. Table 7.2 exemplifies how the development of a partial competence, namely "interacting bodily," can be supported consecutively by using different methodological and epistemological approaches as well as increasingly complex and demanding case studies in the course of the 3-year nursing training.

Table 7.2 Development of the partial competencies of "interacting bodily" by means of different methodological and epistemological approaches

Module title, short description and semester (1–6)	Development	Didactic-methodic dimension
Touch—interaction in body-close care Basic terms: touch, touch qualities, bodily communication, taboo zones, and shame (1)	Focus on the nurses and their self-perception in the experience of different touch qualities as well as different touch needs and their own taboo zones as a prerequisite for a conscious handling of and skills in body-close interactions	Referring to teaching problem-solving competencies/ cognitive skills
Introduction to neurology and the therapeutic touch Basic neurology, anatomy, and physiology; nursing a person with apallic syndrome; stimulating senses; different techniques of basal stimulation (3)	Focus on the cared person and the acquisition of skills to promote and support perception, in particular body awareness; development of confidence in dealing with concrete situations	Referring to training in rule-guided practical skills
Like a heavy potato sack Mobilization support for a person who has suffered great physical and mental loss in old age (e.g., forefoot amputation and the suicide of his son) (3)	Specifically taking other perspectives in order to perceive the connection between external and internal attitude or between body expression and emotional state, and to derive consequences for the design of nursing interventions to promote mobility	Referring to all three approaches
Supporting in trajectory Supporting and informing persons who are coping with chronic diseases, self-body perception, and the development of identity (4)	Explaining the importance of the self-perception of one's own body in conjunction with the development of identity as well as developing competencies in understanding the case and shaping nursing interactions in relation to body perception of those impaired by illness and their *broken self-image*	Referring to an acquisition of personal and social competencies
I cannot even look there Supporting persons through their encounter with a changed, distorted body image and altered excretory functions; care of the patients' stoma with the patient (4)	Aligning the nursing process with the diagnosis body image disorder; adjusting nursing interactions; considering complicating factors such as a change in self-esteem, self-disgust, and defense against the changed excretion	Referring to all three approaches
A girl Supporting adolescents with body Image disturbance and anorexia nervosa in the Children's Hospital (5)	Exercises that provide a body-therapeutic approach to young persons with eating disorders, supporting students understanding body perceptions (developing an understanding view of others)	Referring to all three approaches

Table 7.2 (continued)

Module title, short description and semester (1–6)	Development	Didactic-methodic dimension
I do not understand my husband anymore Supporting a hemiplegic paralyzed and aphasia-affected man and his affected social systems (family, family business, social network) (5)	Enhancing and consolidating nursing support skills in body perception and the control of movement processes in an unstable complex care situation, which is characterized by massive physical disabilities but also by considerable restrictions in communication and conflicts with the family and other social systems	Referring to all three approaches

7.3 Discussion and Conclusion

Curriculum development should be based on scientific theories and research results. Also, the learning content should reflect the current best practices in nursing and reference sciences and rest on teaching and learning theories. In our project the theoretical framework functioned as a scientific basis for the derivation of the competencies, which should be included in the training. In the design-based research process, the developed prototypes were continuously tested, discussed, and evaluated with different participants from the field.

Unlike other curriculum development projects in nursing and medical education, which often use the six-step approach [10] we adopted and modified Knigge-Demal's [12] construction steps for curriculum development. In our opinion the six-step method lacks at an educational science framework. It is therefore strongly focused on utilization requirements in the vocational field and less on education science claims, including personal development and emancipation. As a result, firstly, the learner perspective, which is a fundamental requirement in curriculum development of educational science, is mostly hidden in this approach. Secondly, learning content is no longer identified and legitimized on the basis of its educational potential; rather current problems in nursing are the reasons for educational efforts.

However, even in the educational science approach, the learner perspective is only consulted to a certain degree. Subjective learner needs could be used as an additional source of information for the development of curricula as well as for the selection of educational content and objectives. Also, there is no guarantee that nursing schools will understand and use the curriculum in the right way. Formative evaluation of the learning situations focused on handling and implementation, as well as what information nursing schools and teachers need when implementing the curriculum.

The curriculum was integrated into a database especially developed for the project. Since the beginning of 2019, the database has been available for nursing schools as an open educational resource (http://nakomm.ipp.uni-bremen.de/). Different search functions like thematic groupings support users in their research. The

curriculum database content was written in German, and the structure of nursing education is very unique in Germany, so the curriculum and the learning situations cannot be implemented international without translation and adjustments. But the results regarding the developmental principals can be applied and adapted in other countries and for other health professions.Declaration of Interest and FundingThe authors declare that they have no conflict of interest. The Project was funded by the German Ministry of Health.

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Part III

Implementation and Evaluation of Curricula

Evaluation of the Oregon Consortium of Nursing Education (OCNE) Curriculum

8

Heidi Herinckx, Christine A. Tanner, and Paula Gubrud-Howe

8.1 Background

Oregon Consortium of Nursing Education (OCNE) Curriculum was recognized in two major national studies as a (1) model for innovative curriculum and pedagogy [1, 2] and (2) as an approach to promote academic progression, specifically from Associate Degree (AD) to the Baccalaureate [3]. Schools of Nursing from across the country sought consultation from OCNE faculty about the processes of OCNE development, curriculum design, clinical education model, and simulation development. Because of the potential national implications of this work, OCNE leadership in partnership with the Regional Research Institute at Portland State University secured a Robert Wood Johnson Foundation (RWJF) grant to conduct a comprehensive evaluation of the development of the consortium, implementation of the new curriculum and outcomes of both the consortium and curriculum [4]. The three main objectives of the RWJF evaluation were to (1) identify the key elements of planning and processes used for OCNE development; (2) assess OCNE program outcomes from a variety of data sources collected from students, faculty and employers of new nurse graduates; and (3) create an OCNE teaching fidelity scale and measure the extent to which the OCNE curriculum was implemented across 10 OCNE campuses.

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I. Darmann-Finck, K. Reiber (eds.), *Development, Implementation and Evaluation of Curricula in Nursing and Midwifery Education*,
https://doi.org/10.1007/978-3-030-78181-1_8

8.2 Identify Key Elements of Planning and Processes Used for OCNE Development

A historical analysis of the successful creation of the OCNE curriculum with shared academic standards, admissions and transfer policies from associate to baccalaureate program was one of the first outcomes of the RWJF comprehensive evaluation that could be used by other states engaged in similar efforts [5]. This work identified the driving forces that led to the formation of OCNE, and the processes were used by OCNE leadership to reach consensus in the OCNE curriculum and teaching methods.

Faced with a shortage of nurses and nurse educators, an aging statewide population with increasing chronic illnesses and a need for nurses to work in a wide variety of settings other than acute care, in June 2001, the Oregon Nursing Leadership Council (ONCL) released a strategic plan to meet these healthcare needs. This strategic plan was followed up by an implementation plan with recommendations to transform nursing education by developing a partnership with community colleges and a multi-campus 4-year baccalaureate program. OCNE was created in 2002. This historical analysis discussed how nurse educators became effective change agents to build collaboration among group participants that had historically not worked successfully together, with a discussion of how barriers to reaching consensus were overcome. Lessons learned included the development of a trusting relationship among nurse educators at the baccalaureate and associate degree levels, which was critical to avoid or overcome turf issues. Problem-solving process was developed to identify "hot button issues" or "land mines" and openly discuss them so that the group could come to agreement and consensus to keep the change process moving forward. The OCNE faculty frequently hired and utilized an independent facilitator who would bridge any divide that occurred among members and helped to mediate differences. Finally, the group established ground rules for effective communication that was strengths-based, honest, and respectful of faculty members throughout the change process.

Gaines and Spencer [5] compared OCNE's development process with two leading models of change [6–8]. While Kotter's model suggests a process for planned change, with clearly identified driving forces for change, it did not capture that degree of personal transformational change that many OCNE faculty experienced. Quinn's model suggests that transformational change occurs at multiple levels, from the individual to the organization; and that individuals involved in the change continue to adapt. Gaines and Spencer [5] point out that Quinn's [8] summary of the change experience resonates well with the OCNE experience:

> "This team is not perfect by any means, but it continues to grow. It continues to confront new issues and is adapting on all fronts. I doubt if anyone at our first meeting could have imagined the present level of behavior. To reach this current level, team members had to work hard and make some tough decisions. They all had to pay a price, a price that most management groups are not willing to pay. Deep change at the collective level requires deep change at the personal level. Organizational change cannot occur unless we accept the pain of personal change. These people did, and they grew into something more than they had been." ([8], p. 193).

8.3 Evaluate the Impact of OCNE

8.3.1 OCNE Impact on Faculty Experiences

The RWJF evaluation was designed to provide regular assessment of faculty and student experiences in the OCNE programs and provide feedback regarding the implementation of curriculum and outcomes. OCNE faculty interviews were conducted to learn about their experience implementing and teaching the OCNE curriculum [9]. All OCNE faculty interviews were conducted by telephone in March and April 2009. All one hundred and thirteen OCNE faculty were invited to participate. From this sampling frame, 28 faculty (25%) agreed. All 28 faculty were female. Over half, 57% were from one of the four campuses of OHSU and 43% were faculty from OCNE community colleges. Eighty-four percent, 84% were full-time and 16% were part-time. Over half, 57% were "new" faculty with less than 5 year experience since their hire date and 43% had 5 or more years since their hire date.

The faculty interviews consisted of 18 structured questions that assessed faculty member's perception of the goals of OCNE, the impact OCNE has had on their work life, and the degree to which the school administration, nursing department and community partners (hospitals and practicum sites) supported the OCNE program. Interviews were recorded and analyzed from common themes in the responses.

Most commonly, OCNE faculty stated that the goal of OCNE was to define the competencies of the "twenty-first century" nurse. As one nurse educator stated, "The 21st century nurse is someone equipped with the knowledge and skills to best meet the complex needs of patients in a variety of health care settings based on a core set of competencies." Many OCNE faculty (61%) stated that OCNE was about increasing educational opportunities for nursing students by providing them with a seamless transition into an OHSU baccalaureate program from their community college. OCNE was seen as a way to reach out to rural communities and offer a 4-year degree to students in remote locations of the state. Almost half (48%) stated that OCNE was about improving nursing education through the use of an integrated curriculum, simulation, case-based teaching, spiraling, and interactive learning activities for students and less lecture-based learning. Almost half (48%) also stated that OCNE represented a statewide coalition or partnership between a 4-year university and community colleges with a common goal of creating a shared nursing curriculum used across the state, centralizing resources and making OCNE material available to all nurse educators.

When OCNE faculty were asked about the impact OCNE has had on their work life, responses indicated that while OCNE had increased faculty workload initially, it also provided an opportunity to learn new methods of teaching. Nine faculty, 32% reported that being a part of OCNE gave them "new tools" to improve the effectiveness of their teaching. As one faculty elaborates:

> *I have a stronger focus on the statewide mission because of OCNE and have learned new ways to teach that are more effective. It has been great to be exposed to great teachers within nursing education. I have gained a broader view and understanding of nursing.*

Some experienced faculty felt that participating in OCNE had rejuvenated their passion for teaching. One faculty stated: "*I had not used concept-based learning or case studies before and it has been very rewarding for me*." Another faculty said "*OCNE is energizing. I have learned a lot about teaching from my colleagues.*" One new faculty moved to Oregon specifically to teach within OCNE. A second "new" OCNE faculty had returned to teaching after a 10-year hiatus because of her interest in teaching within OCNE.

Nurse educators were also asked: "What impact has OCNE had on the way you teach?" The responses focused on the variety of teaching techniques used by OCNE faculty, most commonly: (1) increased use of case studies; (2) increased use of simulation; and (3) focus on deep learning/change in content coverage.

Increased use of cases. Of the faculty who said that they had increased their use of case studies as a result of OCNE, most faculty (76%) reported that they found the case studies very effective. At least three faculty stated that they had always used cases in their teaching, but that OCNE reinforced the use of case-based teaching. Some of the positive attributes of case studies reported by faculty include their ability to generate rich discussion, give students opportunity to broaden what they see as good nursing practice and "make nursing practice more real for students."

Use of simulation. Faculty reported that in OCNE, simulation technology is more integral to student learning and provides a dynamic and safe learning environment for students. Most faculty stated the simulations helped the students increase clinical skills and clinical judgment. Simulation is a way to provide standardized clinical scenarios that all nursing students "should experience" rather than leaving it up to "chance encounters in real clinical settings."

Focus on deep learning and change in content. Twenty-two percent (22%) of faculty felt that OCNE focused greater attention on "deep learning" such that curriculum content covered fewer subjects in greater depth. Deep learning was sometimes described as a reduction in content but also focused on "spiraling" content and coming back to topics in greater depth as well as less reliance on lecture and PowerPoint and more attention to active student learning exercises and discussion.

OCNE faculty reported broad based support for OCNE at the faculty level, departmental, college administrative level, and clinical partner level. Statements regarding faculty and department levels of support were overwhelmingly positive. Interview participants described the level of faculty support as "excellent," "very supportive," and "high in this group." Other faculty stated that their nursing departments were "totally on board," "have accepted and embraced the model," and "are totally committed." Clinical partners' level of support was also rated very positively by OCNE faculty, especially when the expectations of OCNE were clear to them. One faculty characterized the support for OCNE at the local hospitals and clinical sites as "excellent." Another faculty stated: *"The hospitals have been very supportive of OCNE … they have said in so many words, that they would prefer that we teach students to think critically…that they can teach them other skills when they get them. And we explain to them that this is what OCNE will provide."*

8.3.2 OCNE Impact on Student Satisfaction

OCNE students are surveyed at years 2 and 3 in the program, and 1and 3 years post-graduation using valid and reliable nationally normed surveys. Each factor is measured on a 1–7 scale, with 7 being higher levels of agreement or satisfaction. Pre-OCNE data were collected for classes graduated in 2006 and 2007 and post-OCNE for classes graduating in 2009, 2010, and 2011. Throughout the RWJF evaluation period, student ratings were remarkably stable, ranging from 5.26 to 6.25 (slightly to moderately satisfied). There were no statistically significant differences found in student satisfaction pre- and post-OCNE [10]. Students were very satisfied with their level of preparation in core competencies and professional values.

In third term student survey data collected in 2010, OCNE students indicated that there was not adequate advising from the university to assist them in making the decision to purse a 4-year degree and identified barriers to successfully transfer to OHSU [11]. OCNE responded to these results with two initiatives. OCNE (1) hired a part-time community college student advisor to assist students in their decision-making about transfer to the university; (2) expanded outreach to employers of community college graduates to discuss ways in which the students could be supported in their employment settings (e.g. scheduling compatible with class schedules). Currently approximately 30–35% of OCNE community college graduates transfer to OHSU for completion of their baccalaureate degree.

Student surveys found virtually no change in employment setting pre- and post-OCNE. About 73% of graduates were employed in acute care settings after graduation. The fact that there were no changes in proportion of graduates practicing in non-acute community-based settings is explained by several factors. For example, there are proportionately fewer positions for registered nurses in community-based settings than in hospitals; when positions are open, they often require 1–2 years of experience in an acute care setting.

8.3.3 OCNE Student Outcomes: Increasing Baccalaureate Prepared Nurses

One of the intended primary goals of OCNE was to increase the number of baccalaureate prepared nurses in Oregon by creating a seamless transition process by which a nurse who completed an AD at an OCNE community college could transition directly into OHSU for the completion of their baccalaureate degree within one extra year. The Institute of Medicine set a goal in 2010 for 80% of the RN workforce to have a bachelor's degree by 2020 [12]. In the RWJF proposal, OCNE had set a statewide benchmark to achieve a 70% OCNE graduation rate with a bachelor's degree. The design of the OCNE program allowed students to complete the final year of a baccalaureate degree at the any of the OHSU campus locations around the state or online in their home community. Other barriers were removed to make the transition easier as well. For example, since the curriculum was essentially identical

on all campuses, the need to repeat any course was eliminated and course credits and financial aid could be transferred to OHSU to complete students' fourth year.

As part of the RWJF evaluation and through an established data sharing agreement among all OCNE participating colleges, administrative data on OCNE student enrollment, course completion, and graduation for the entering classes of 2006, 2007, and 2008 were analyzed to examine how many students transferred to the baccalaureate program. For these three cohorts, community college programs graduated 760 students eligible for direct transfer to OHSU; however only 228 (30%) had actually transferred. This 30% transfer rate was a remarkable improvement over comparable national rates reported at that time indicating that only 9.6% of AD graduates obtained a baccalaureate degree in nursing within 8 years of obtaining their AD degree ([13], section 9.3, p 204, as cited in [14]). One of the challenges to measuring bachelor degree completion is that the timing of academic progression between AD graduation and entry into a bachelor's degree is lengthy and hard to measure. National data indicates a 7.5 year lag on average between the two ([13], p. 62).

To explore the factors that influenced OCNE community college students' decisions to continue directly for a baccalaureate degree, the RWJF evaluation team conducted a survey of OCNE students who completed their AD in 2010 but did not enroll in baccalaureate coursework at OHSU within 6 months after AD graduation and RN licensure. 208 graduates who did not pursue a baccalaureate degree were invited to participate in an anonymous 15 question web-based survey, 87 (42%) responded. The survey examined the employment status of nursing graduates, intention and timing to continue academic nursing education and factors influencing their decision to pursue a baccalaureate degree.

Regarding employment status, the survey found that 75% of recent OCNE graduates were employed as RNs. Nearly 60% of respondents reported an intention to continue nursing education in the future, mostly within the next 2 years. Financial concerns were the most significant factor influencing RN's decisions to pursue a baccalaureate degree. Thirty-five percent of respondents reported that they expected to receive a salary differential from their current employer for completion of a nursing baccalaureate degree. However, only 28% reported the availability of financial support, tuition subsidies, or tuition assistance with another 23% stating that they expected tuition assistance from their employer after 1 year of employment as an RN. It was interesting to note that more than 20% of this cohort of OCNE AD students held a prior non-nursing bachelor's degree and of these, 15% expressed a desire for an RN-MSN education track.

8.3.4 OCNE Impact on RN Licensure

Historically, graduates of Oregon nursing programs have had a high pass rate on the National Council Licensure Examination (NCLEX), ranging from 92 to 100%. The implementation of the OCNE curriculum redesign had no impact on nursing students' ability to successfully pass the NCLEX exam. The NCLEX pass rates for

OCNE students as measured during the RWJF evaluation ranged between 88 and 100% ([4], p. 23). This was an important finding because several nurse educators feared that the deliberate reductions in course content in the OCNE curriculum redesign to promote deep learning could negatively impact students' ability to achieve licensure.

8.3.5 OCNE Impact on Clinical Performance of Graduating Students

To evaluate the effectiveness of the OCNE curriculum in developing clinical competencies, OCNE faculty developed a clinical competency scale (CCS), drawing items from the National Council of State Boards of Nursing Competency assessment instrument. The CCS is completed by clinical teaching associates (CTAs) who are staff nurses working in a 1:1 mentor/supervisory relationship with the student during their final 20-week integrative practicum. In 2008, student CCS scores were compared for four post-implementation OCNE schools and two pre-OCNE implementation schools. OCNE students scored an average of 161 total points on the CCS, 4 points higher than students at pre-OCNE schools with an average score of 157 ($t = -2.23$, df = 243, $p = 0.026$). These results were encouraging, but it was also apparent that there may have been a rater bias by having the CTAs, who had worked closely with the students for several months and may have had an investment in their doing well. Pre-OCNE CTAs did not have this long association with students, nor the 1–2 day training to prepare them for the CTA role. Subsequent examination of CTA ratings revealed consistently high ratings of students across all campuses.

To address these methodological issues, in 2015, the OCNE Research and Evaluation Committee reviewed 4 years of CCS data and determined that there was limited variability in competency attainment, even on items where they expected variation in performance among students. For example, one of the competencies addressed evidence-based practice, a competency we expected to see only at beginning levels. However, clinical teaching associates consistently rated their students on this competency at a high level of performance. The OCNE Research and Evaluation committee began investigating alternative tools and adapted an instrument developed by a research team the California Institute for Nursing and Healthcare [15]. The OCNE Research and Evaluation committee, with permission from the authors, has revised and renamed the tool the OCNE Clinical Competency Assessment Tool (OCCAT). The original tool uses Quality and Safety in Nursing Education (QSEN) competencies as the organizing framework. The OCCAT has been revised to align fully with the OCNE competencies with emphasis on clinical judgment and reasoning. Initial reliability and validity results are encouraging and the majority of OCNE campuses are now using the latest version of the OCCAT to assess student attainment of clinical competency at the end of program. CTAs and faculty use this instrument to assess students once they have completed 50% of required integrative practicum hours and at the end of the practicum.

The work of OCNE faculty members on improving performance evaluation is representative of the efforts needed more broadly in response to accelerated movement toward competency-based education. As Wagner et al. commented, "assessment and evaluation are the Achilles heel of competency-based education". The main challenge to date is adopting a framework for assessment that is not overly granular, requires the integration of competencies in the authentic workplace, and can have faculty support, development, and buy-in. ten Cate [16] introduced the concept of entrustable professional activities to be associated with the competencies medical students must demonstrate before they advance to residency. "Entrustable" designates the extent to which the learner is "trusted" to perform the activity with what degree of supervision. Wagner and colleagues were able to demonstrate the applicability of EPAs in the evaluation of competencies in quality and safety in advanced practice nursing [17]. Other investigators have explored their usefulness in undergraduate education [18, 19] and in transitioning nurse practitioner students to practice [20]. The nearly 15 years of research and application in graduate and undergraduate medical education provides excellent groundwork for other health disciplines, including nursing, to explore this promising approach to the challenges of authentic clinical performance assessment in competency-based education [21–23].

8.3.6 Employer Satisfaction with OCNE Nurse New Graduate Clinical Performance

To assess the clinical performance of new graduates, we developed a measure asking front-line supervisors about their degree of satisfaction with new graduate performance. To identify a sample, the RWJF research team in conjunction with OHSU nursing faculty compiled a list of known employers of nurses from local hospitals, clinics, assisted living centers, and other healthcare providers in Washington and Oregon. A list of over 170 healthcare employers was generated. Snowball sampling of healthcare providers generated additional employers to add to the list in an expanded circle of outreach. Nurse supervisors were sent a survey and asked to rate their satisfaction with one "new nurse," defined as an individual who had graduated from nursing school in the past 12 months, who had been hired in their department in the past 12 months. Level of satisfaction with the nurse's work performance was rated for 11 competencies or skills on a five-point Likert scale, ranging from "very dissatisfied" to "very satisfied." Additional questions included: the school the new nurse came from; the degree type of the new nurse, AD, BS, or BSN; the type of organization the new nurse was hired by; and an open-ended question to describe the level of preparedness of the new nurse hired.

One hundred and forty-five (145) surveys were completed by nurse supervisors, 77 for non-OCNE graduates and 66 for OCNE graduates, 2 were missing this variable. In addition, 46 were AD graduates and 99 were BS graduates. Overall ratings

of employer satisfaction were high with no differences in overall satisfaction found between OCNE graduates and non-OCNE graduates or between AD and BS graduates. Employers were most satisfied with a new nurse hire's ability to develop a caring relationship with patients, individualize care, and ask for help when needed. Employers were least satisfied with a new nurse's ability to take a leadership role, organize their time effectively and with their ability to perform technical skills safely and accurately.

We were surprised to find that OCNE graduates did not have higher ratings on employer satisfaction that non-OCNE graduates and that employers rated AD and BS students equally. One might expect that BS level students would have more entry level experience than AD graduates which would result in higher initial employer satisfaction. The results of this analysis were limited due to the small sample size and limited scope of the survey.

8.4 Create OCNE Teaching Fidelity Scale and Measure OCNE Implementation

The OCNE program represented both innovations in curriculum (selection, organization, and sequencing of content) and advances in pedagogy (active learning activities, case-based instruction, and high fidelity simulation) [24]. The OCNE curriculum is based upon 10 core competencies and established student benchmarks for each year of progression through the program. OCNE curriculum is organized around foci of care (e.g., health promotion, acute care, chronic care, and end of life care) and cross-cutting competencies (e.g., population based care, leadership, and outcome management). The pedagogy innovations adopted by OCNE include increased case-based instruction and the use of high fidelity simulation [2, 25, 26]. One of the main goals of the RWJF evaluation was to measure how the changes to the OCNE pedagogy and curriculum impacted student outcomes. Equally important was to measure the extent to which each campus had implemented the new OCNE curriculum and pedagogy across the OCNE campuses. The RWJF evaluation team created the OCNE Classroom Teaching Fidelity Scale to measure the extent which the OCNE teaching model was being implemented and followed [27].

Fidelity scales are similar to rubrics commonly used in nursing education in that they clearly define and operationalize behaviors, in this case teaching strategies and elements of the OCNE curriculum into measurable benchmarks. Fidelity scales are a tool commonly used in behavioral health to measure the implementation of evidence-based clinical practices such as the Assertive Community Treatment Model and the Individual Placement Model of Supported Employment [28–31]. The primary purpose of fidelity scales is to identify the key elements of a model and to develop anchors that operationalize the implementation of these key elements to be able to measure the extent to which core elements are evident in practice. Fidelity scales are used to measure implementation of best practices in multi-site studies to

ensure a practice is implemented to fidelity and to provide context that help explain differences found in outcomes.

8.4.1 Methodology for OCNE Classroom Fidelity Instrument Development

The OCNE Classroom Teaching Fidelity Scale was developed by a three-person team consisting of the RWJF lead evaluator from the RRI experienced in creating fidelity assessment tools, a nurse educator with many years of classroom teaching experience, who had helped develop the OCNE model, and a senior research assistant. A multi-staged process was used which included: (1) review of collegiate classroom observation literature; (2) initial and ongoing input from the national and regional advisory committees; (3) identification of the essential elements of OCNE curriculum and pedagogy for the initial formulation of the fidelity scale items and anchors; (4) classroom observations in 2008 to test and modify the instrument; (5) classroom observations in 2009 to further refine scale components and rating anchors.

The scale development team began with a review of the nursing literature to assist with the operationalization of pedagogies appropriate for nursing education [2, 26, 32–35]. Additional published nursing education literature was reviewed to learn of existing scales or evaluation tools in nursing education [2, 36]. These materials provided useful conceptual frameworks for measuring aspects of the quality of teaching; however, the authors ultimately focused the scale on operationalizing the OCNE core competencies and evidence-based teaching methods. The key components of the OCNE model were identified from curriculum documents including OCNE's 10 core competencies, benchmark rubrics, course descriptions, and course syllabi. The Clinical Judgement Model [37] and related research publications [38] were also reviewed to assist in formulating items on the scale.

OCNE's Regional and National Evaluation Advisory committees informed the development and refinement of the instrument on multiple occasions throughout the development process. The regional board members were faculty currently teaching in the OCNE curriculum who helped operationalize teaching behaviors and described how OCNE would be evident in the classroom. The national board was comprised of nurse education leaders who graciously provided guidelines and instruments as reference materials from the Carnegie Foundation research on nursing education and reviewed drafts of the instrument.

The OCNE Classroom Teaching Fidelity scale underwent two rounds of piloting during the RWJF grant period with classroom observations in the Fall of 2008 and Fall of 2009. In 2008, the goal of the first round of classroom observations was to refine the operationalization of the OCNE curriculum items and anchors for scoring. Throughout 2008, the scale was revised as more teaching behaviors were observed, categorized, and placed on the instrument as anchors. After the scale was initially piloted and completed its third review by the advisory committees, it was released to OCNE campuses for faculty input and to encourage a transparent evaluation process.

The second round of classroom observations in Fall of 2009 focused on testing and refining the anchors of the scale and collecting preliminary ratings on OCNE curriculum and pedagogy implementation. The class sessions and faculty observed were more or less randomly selected based on the evaluation team's travel schedule to each campus and geographic clustering of campus visits. Lead faculty or directors were asked not to alter faculty or content from what was originally planned for the day of the observation. Over the 2 years of classroom observations, fidelity measurements were collected for 24 classrooms at the 10 campuses.

The OCNE Classroom Teaching Fidelity Scale consists of 15 items that focuses on the 10 OCNE competencies. Additional items measure the client as the intrinsic focus of the learning, use of case-based teaching, inclusion of contextual variables of the patient's holistic characteristics, and consideration of the lived experience of the patient such as their perception of illness, choices, priorities, and desired outcomes. Several items focus on learning strategies such as spiraled learning, use of evidence-based educational practices for the promotion of deep learning, questioning strategies and pace of the class.

Eleven items are evaluated on a 5-point scale. A score of 5 represents adherence to OCNE curriculum and pedagogy and a score of 1 represents approaches contrary to or lacking explicit compliance with the OCNE model. In some instances, a low score represents traditional teaching approaches, particularly where traditional teaching approaches have been found to be less effective. Items as well as anchors were established with objective criteria (observable faculty and/or student behavior in the classroom setting) for each scale point. Four items that measure the learning environment are rated on a 3-point scale. The total score possible for all items is 67 points.

8.4.2 Findings from OCNE Implementation Assessment

Fidelity to the OCNE model of curriculum and teaching was measured by the OCNE Classroom Fidelity Scale through classroom observations in the Fall of 2009 for all 10 OCNE campuses. Out of a total possible score of 67, two campuses scored above 60, four campuses scored between 50 and 60, and four campuses scored below 50 (40%). The two top schools could be categorized as demonstrating high fidelity, four schools as moderate fidelity, and four schools with low fidelity.

The items with the highest average score across all OCNE campuses were pace of the class, clinical relevance of the class, learner engagement, and making the client experience central to the learning activity. The two items with the lowest scores were clarity of class outcomes and clinical judgment. It is encouraging that all campuses had successfully implemented some aspects of OCNE classroom pedagogy; even colleges with the lowest total scores had some individual items that scored at a 4 or above. The schools with the highest degree of classroom teaching fidelity were those in the third year of implementation. Those with the lowest scores were in the second year of implementation suggesting that OCNE implementation was further along for those more experienced with the curriculum and teaching methods.

The assessment of the OCNE curriculum implementation was limited by the few numbers of classrooms observed. Only 24 class sessions were observed over 2 years. It would be recommended that multiple class sessions across all OCNE faculty on each campus be observed to get a complete and accurate measure of OCNE model fidelity. Ongoing fidelity assessment is one method to ensure that colleges are maintaining fidelity to the OCNE curriculum and teaching and not drifting back to traditional curriculum and teaching methods.

The curriculum committee encourages campuses to use the Classroom Fidelity Scale to support the development of new faculty and facilitate the full integration of OCNE pedagogy into the classroom. The OCNE Administrative Fidelity Scale is completed by academic administrators on each campus every three years. It includes two major sections: (1) evaluating the degree of curriculum implementation by reviewing each course syllabus evidence learning activities related to each course outcome and core competencies; (2) assuring that all campuses are adhering to the agreements among OCNE members such as admission and progression standards, quality of library holdings, and other student service agreements. The findings are reported to the Coordinating Council and campuses struggling to maintain fidelity are coached and supported by the OCNE leadership team.

8.5 Conclusions

Findings from the OCNE evaluation demonstrate that many of the overarching goals were met. A summary of key findings are presented below.

1. OCNE succeeded in increasing the supply and distribution of baccalaureate level registered nurses in Oregon. In the first three cohorts of OCNE AD graduates, 30% enrolled in the baccalaureate completion program at OHSU within 3 years of completion their AD degree. Since then, 30–35% of students consistently enroll in the baccalaureate completion program at OHSU.
2. OCNE has improved access to a 4-year degree program in rural and frontier areas of Oregon while retaining a strong clinical component. Students are more likely to be employed in these rural areas following completion of their BS degree if they are able to stay in their home community, rather than moving to one of the Univeristy campuses for the final year of their education. OCNE makes this possible: faculty from OHSU teach didactic courses online; faculty with joint appointments to OHSU and the community college teach community-based and leadership clinical experiences in their home community. The final integrative practicum is supervised by staff nurse clinical-teaching associates (CTA's), with online support from OHSU faculty.
3. Overall, evaluation findings did not document improved quality of nursing education as measured by student outcomes. Even variations in OCNE implementation did not impact student performance. Six of 10 OCNE schools (60%) demonstrated high to moderate OCNE implementation compared to 40% of schools with low OCNE implementation.

4. We learned that transformation changes in teaching take time—the change is a series of processes, not events.
5. The evaluation found no significant relationship between OCNE classroom fidelity scores and student performance data (as there was no variation by campus in student performance data). This was a disappointment to OCNE faculty, but it also shed light on the need for continued instrument development and testing for use in competency-based programs.
6. The first time pass rate for nursing students on the National Council Licensure Examination (NCLEX) was not positively or negatively impacted by the implementation of the OCNE curriculum and remains high at state current NCLEX pass rate.
7. OCNE faculty reported a high level of satisfaction in their work. They valued the collaboration among schools, the OCNE competencies, the incorporation of evidence-based teaching strategies. Faculty have been provided tools through the shared curriculum and teaching activities to address current healthcare needs, in ways that were typically unexplored in previous curricula.
8. Students were moderately satisfied with their programs and feel well-prepared in core nursing values and competencies. The OCNE program was responsive to student feedback by providing additional student advising to assist with transition to complete the fourth year baccalaureate program.
9. Employers of new graduate nurses were highly satisfied with quality of nurse graduates from OCNE programs and non-OCNE schools alike. Employers were also equally satisfied with AD level and BA/BSN level new hires.

In summary, we learned from nurse educators that the key to the development of OCNE was faculty inclusion and a common vision of what it means to be "teaching the OCNE way" and working closely with fellow faculty to make it happen. The following advice to new OCNE colleges exemplifies the consensus building and faculty commitment needed to develop and implement the new curriculum and the inclusiveness that was encouraged throughout the process:

> *I think they have to buy into it … by having philosophical discussions. It's…it's kind of like being that band of brothers, you know, where you come together and work on the common ground …There won't be buy in right off the bat so each person has to find where the value of it is for them…and then continue working as a cohesive group, but everybody needs to play a role, everybody needs to be involved. There should be ground rules that there are no outsiders…I think everything needs to be laid on the table and everybody needs to be honest with each other, be able to ask questions, and be open and disagree and that's…that's ok. And be prepared to have a steep learning curve.*

As nurse educators looked into the future at what would be needed to sustain OCNE, they identified the need for continued financial support for OCNE infrastructure; continued collaboration and communication among OCNE faculty; ongoing faculty development and OCNE "booster sessions" for new, part-time and even seasoned OCNE faculty; and ongoing process and outcome evaluation to ensure fidelity to the

OCNE model, and measure the extent to which OCNE is meeting its goals and objectives. Most faculty felt that OCNE will continue to undergo minor changes for overall program improvement but that OCNE's transformational curriculum and pedagogical changes were here to stay.

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Part IV

Interesting Examples

9 Development of the Oregon Consortium for Nursing Education: Delivering an Innovative, Competency-Based Curriculum in the USA

Christine A. Tanner and Paula Gubrud-Howe

9.1 Background

In the early part of 2000s faculty representing Oregon community college and university nursing collaborated over a 4-year period to create a cutting-edge competency-based nursing curriculum, to be offered on both community college and university campuses, that was responsive to emerging health care needs, changing nursing practices, and advances in learning science. Working through the newly established Oregon Consortium of Nursing Education (OCNE), the faculty representatives from each campus engaged in faculty development, while simultaneously beginning work on development of the new curriculum. These faculty representatives also led changes on their respective campuses to test new pedagogies and encouraged their faculty colleagues to participate in curriculum work and to register for a summer faculty development program.

In 2005, the curriculum was approved by each community college and university faculty, as well as Oregon regulatory bodies and national nursing accreditation organizations. By fall of 2006, the first cohorts of students had completed their 1 year of prerequisites and begun their nursing coursework on four community college campuses and four campuses of Oregon Health & Science University (OHSU). Over subsequent years additional community colleges joined the consortium, and OHSU added a fifth campus. Today, the curriculum has been adopted on 16 campuses, including 11 community colleges and the 5 campuses of Oregon Health & Science University. Over 5000 students have completed the program of study.

In this chapter, we will describe the conditions in the USA that prompted schools of nursing to engage in this unprecedented collaborative reform effort. We will present our approach to the development of our competency-based curriculum, the

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I. Darmann-Finck, K. Reiber (eds.), *Development, Implementation and Evaluation of Curricula in Nursing and Midwifery Education*,
https://doi.org/10.1007/978-3-030-78181-1_9

principles we adopted which are grounded in learning science, the design of learning activities including those embedded in our new clinical education model. Finally we will mark the current status of OCNE.

9.2 The Need to Transform Nursing Education in Oregon

Since the mid-1950s, the USA has had multiple educational pathways to registered nurse (RN) licensure: diploma education through hospitals, associate degree education through community colleges and baccalaureate education through colleges and universities. Although the profession, since 1965, has held the bachelor's degree as the minimum requirement for RN licensure [1] there had been very little movement toward this goal. Community colleges have historically provided access to RN education in rural areas, which was otherwise often unavailable until the advent of online education models. In an effort to improve access to baccalaureate education, some university programs developed articulation agreements with nearby community colleges in order to ease the students' transition from one curriculum to another, reducing the oft-experienced repetition in coursework. At the time faculty began work on the consortium in 2002, only 40% of nurses were baccalaureate prepared, and only 10% of RN graduates from associate degree and diploma programs continued for the bachelor's degree [2].

In the latter part of the 1990s and early 2000s, the USA and many other countries faced an acute nursing shortage that was expected to worsen over the next two decades. National and state-level studies of the nursing workforce projected a significant shortage by 2010 [3, 4]. Studies during this time period also showed that new graduate nurses were ill-prepared to practice in the rapidly changing health care environments. The Joint Commission on Accreditation of Healthcare Organizations described a "continental divide between nursing education and practice" and suggested that "nurse educators were teaching to yesterday's health care environment" [5]. At the same time, the Institute of Medicine (IOM) released a series of reports on poor quality of care and prevalence of medical error in US Health Care System, and argued that one route to improve care was in transformation of health professions education [6–8]. We acknowledged that similar issues existed in Oregon that the nursing education system as it existed then was not responsive to major issues in health care, nor was it addressing the full range of health care needs among Oregonians. During 2000–2002, the Oregon Nursing Leadership Council, a representative group of nursing organizations engaged in a process of strategic planning to address these problems. The result was a widely accepted plan outlining major goals, including two directed toward nursing education: (1) double enrollment in Oregon Nursing programs by 2004 and (2) redesign nursing education to meet more directly the changing health care needs of Oregonians [9].

While the outcome of this planning effort was important, also significant was the development of an unprecedented level of collaboration among organizations with sometimes competing interests and values. Representatives to the council made a

commitment to a different kind of leadership model, one in which the critical health care needs of the population nursing serves and the societal contract with nursing as a profession would trump individual and specific organizational interests. This commitment produced many positive consequences: (1) the development of a level of mutual respect and trust among individual members that allowed for open debate, confrontation of long-standing assumptions and stereotypes, and changing perspectives about one another; (2) the evolution of an open communication pattern that required honest exchange of ideas; (3) the demand that council members do an honest appraisal of the state of nursing and nursing education, creating a shared vision for what nursing in Oregon could be; (4) the promise of each individual member to lead their respective organizations toward this shared vision and (5) shared commitment to meeting the health care needs of all Oregonians. The processes and norms developed by the Oregon Nursing Leadership Council (ONLC) in the early planning set the stage for continued high degree of collaboration as its subcommittees proceeded to develop further plans to achieve the strategic goals [9–12].

Acting on the mandate to transform nursing education, the ONLC Committee on Education began work on the development of new competencies. Using studies of leading health indicators [13] safety and quality issues [6], population studies of emerging health care needs and related demographic shifts [14] and analyses of necessary knowledge, skills and attitudes for health professionals [15] the committee identified, validated, and promulgated new competencies for the professional nurse. These core competencies addressed the need for nurses to be skilled in clinical judgment, evidence-based practice, relationship-centered care, interprofessional collaboration, ethical comportment, quality improvement and leadership. New competencies were also needed which recognized the increasing prevalence of chronic illness, the participation of families in caregiving, and thus the rapidly changing practices in palliative care and chronic illness management; the needed emphasis on nursing roles in primary care and health promotion, rapid changes in hospital-based practice as the length of hospital stay steadily declined and patient acuity increased. The committee concluded that the full attainment of these competencies would require at least a 4-year baccalaureate degree. The committee was also clear that the "content" related to these new competencies could not just be added to existing nursing curricula; rather it would require transformation in both the what and how of teaching.

To assure that Oregon's future nurses could be educated in these competencies, particularly in a climate of scarce resources, enrollment limitations in baccalaureate programs and a looming faculty shortage, the ONLC Education Committee recommended the establishment of a partnership among all nursing programs in the state, which would be formalized through consortium agreements. Endorsed by all of Oregon's nursing programs in September 2002, the Oregon Consortium for Nursing Education was launched with the following goals [9]:

- A shared, competency-based curriculum culminating in a Bachelor of Science degree with a major in nursing. Students could complete the first year of prerequisites on any campus of the higher education system in Oregon, and the first

2 years of the nursing curriculum on any consortium campus. The fourth-year courses would be offered by the University on one of its campuses, or online with clinical experiences in the student's home community. The student completing the first 2 years of the nursing curriculum along with pre- and co-requisites would earn the Associate of Applied Science and be eligible to sit for the RN licensure exam. The shared curriculum would offer seamless transition to the university for an additional year of study and completion of the baccalaureate degree.

- A collaborative process for development of this shared baccalaureate curriculum and agreements that are needed to support the shared curriculum, such as student services across institutions (e.g., seamless financial aid, co-admission, dual enrollment, Americans with Disabilities (ADA) accommodation and common academic standards such as admission, progression and graduation requirements).
- Mechanisms for sharing faculty and/or faculty expertise.
- Mechanisms for improving access to clinical education including:
  - Shared planning for clinical experiences
  - Exploration of new clinical education approaches that would align learning experiences with the established competencies
  - Development and use of state-of-the-art clinical simulation to augment on-site clinical training, making use of shared instructional materials, with simulation laboratories available to each campus

Partnership in the consortium was voluntary, and schools of nursing could opt for full partnership, which meant that they would participate in the development of and adopt the shared curriculum or associate partner, through which they could obtain some of the benefits of the collaboration such as shared faculty development, increased purchasing power for items such as simulation-manikins.

9.3 Curriculum Development and the Role of Learning Science

Faculty representatives from each of the community colleges and university formed the 35-member OCNE Curriculum committee. With the support of foundation and federal grants, we began our work with intensive faculty development, focusing on the science of learning, nursing education research, and pedagogies that derived from this rapidly evolving body of work [12]. With assistance from consultants and faculty experts, curriculum committee members reviewed and discussed major educational and nursing research, and explored pedagogies which are directed toward competency achievement. Most faculty members struggled with content overload, and the inability to "cover it all" coupled with their sense of accountability for students to successfully pass the licensure exam. From our early days, much of our conversation was focused on how we can possibly add anything more to the curriculum. Yet we knew that the superficial coverage of content was not sufficient for students to engage in the complex clinical decision making and judgment required

in practice. And we were committed to improving graduate's readiness to practice in emerging areas of practice. So, we sought consultants whose expertise was in deep learning and in the structure of curricula and learning activities that would support this kind of learning. Through workshops with consultants, several faculty members developed new strategies to try in their current courses, strategies which required less talking, more inquiry, and more engagement on the part of learners. They returned to our sessions enthusiastic about their efforts and feeling as if they had made new discoveries about how students learn nursing. The reports of their successes and challenges with new approaches inspired members of the curriculum committee and helped to keep them engaged in this challenging and long-term effort.

Over the first year, we agreed on principles guiding our pedagogy, and ultimately our curriculum decisions about the selection, organization and sequencing of content. The following were among our key agreements:

9.3.1 Focus on Deep Understanding

We agreed that our pedagogy would focus on facilitating deep understanding of the discipline's most important concepts as used in clinical practice [16]. The Understanding by Design model (UBD) outlines the questions to be addressed during curriculum design: (1) "What is worthy and requiring of deep understanding? (2) What is evidence of understanding? (3) What learning experiences and teaching promote understanding, interest and excellence?" ([16], p. 18). As a way to engage in the first question, the committee revisited, then renewed Henderson's [17] classic definition of nursing, which provided our initial enduring concepts of nursing [17]. Nurses' mission is to improve health through enhancing the self-care capacity of individuals and families and the essential organizational and community conditions. According to Henderson [17], nurses' unique function is to help individuals, both sick and well, perform activities that contribute to their health or recovery (or facilitate a peaceful death) that they would perform unaided if they had the necessary strength, will, or knowledge, and to accomplish this function in such a way as to help individuals gain independence. We added to this definition "Nurses achieve this mission through attention to relationships, a deep understanding of the care experience, and the exercise of skilled clinical judgment in the application of nursing science and art" [9]. Each of these concepts was ultimately reflected in our competencies.

As we learned from our consultants, deep learning often involves sophisticated insights and abilities and is essential for nursing practice in increasingly complex situations. To teach for deep understanding, it was clear that we needed to use pedagogies that actively engage the learner in solving problems about authentic clinical situations. We agreed to use our classroom time as if it were clinical practice, providing a variety of hands-on, group-based learning experiences that would help contextualize complex concepts. Work by Wiggins and McTigue [16] with consultation from the Understanding by Design Group (UBD) as well as writings by Fink [18] and a workshop led by Dr. Fink were extremely helpful sources thinking about how

our teaching time would be used in this new model. They suggested the following characteristics of learning activities and assessments. They …

- Are realistic in that they replicate the ways the learner's knowledge and abilities are tested in real-world situations. In other words, situated in a realistic context.
- Require judgment and innovation in which the student has to use knowledge and skills to solve problems, in which the solution requires more than following a protocol or set routine.
- Simulate the contexts in which adults are tested in the workplace—engage them in conversations about particular clinical situations students have encountered during their clinical practicum, that requires reflection on the knowledge and abilities used to address the situation. Simulation-based learning experiences (SBLEs) provide an opportunity to structure clinical problems in a way to challenge and engage students in clinical reasoning.
- Provide opportunities for students to rehearse, practice, consult resources and get feedback on and refine their performance.
- Assess the student's ability to use a repertoire of knowledge and skill to negotiate a complex task. Select performance tasks that are authentic for what a professional nurse is expected to do.

The agreement to focus on deep learning resulted in three additional concessions.

- To deliberately reduce the amount of content covered. Actively engaging students in classroom discussions meant that classroom time could no longer be devoted to covering enormous amounts of content through passive lecture.
- We frequently reminded ourselves of several maxims:
  - The more you cover, the less you learn. Our job is to uncover!
  - The question to ask in preparing for class is "What do you want students to learn?" Not "What do you want to cover?"
- To guide students in learning how to learn, to access, and evaluate information from multiple sources to answer clinical questions, learning the content as it is relevant for their practice.
- To create learning activities that are contextualized in clinical nursing practice.

These principles were later driven home in the Carnegie Study of Nursing Education [19]. This multi-year study of nursing educational practices at selected schools of nursing throughout the USA found that the predominant teaching approach was decontextualized lecture, perhaps linked to concepts and principles but with little relationship to clinical practice. Benner and colleagues highlighted case-based teaching and clinical coaching as two signature pedagogies in nursing that would serve our profession well if practiced in schools of nursing around the country.

9.3.2 Emphasize Clinical Reasoning in Classroom and Clinical Instruction

From the beginning of the education reform work, the curriculum committee recognized the need to place more emphasis on clinical reasoning and clinical judgment. Our work with our consultants on learning science and nursing education research clearly reinforced our understanding of this need. Tanner and colleagues' program of research on clinical judgment greatly informed our work. The focus of this work was research on the processes of clinical judgment, such as diagnostic reasoning strategies [20–22] intuition [23], clinical judgment and the development of expertise [24], knowing the patient and clinical judgment [25]. Tanner had also completed several integrative reviews of the research on clinical judgment [26–28] that culminated in the development of a descriptive model of clinical judgment [28]. Our recognition of clinical judgment as a significant part of clinical practice has recently been endorsed by the National Council of State Boards of Nursing, the body responsible for development of licensure exams. In 2018, the Council launched an effort to make significant changes in licensure exams to focus much more on clinical reasoning. They have produced a measurement model [29] drawing on studies of clinical judgment within three clinical reasoning frameworks: (1) Intuitive-humanistic, (2) Dual Process Reasoning Theory, and (3) information processing model. The Council expects to launch the "Next Generation NCLEX" (NGN) by 2023 [30].

Case-based learning (CBL), by definition, seemed to be an ideal approach from a learning science perspective and from research on clinical judgment. Early discussion of case-based learning led to its adoption as a signature pedagogy. Benner et al. [19] define a signature pedagogy as one that is practiced as the most common and effective approach for teaching the subject matter, i.e. in this case, the practice of nursing. For example, Benner et al., found clinical coaching as a signature pedagogy in nursing. Case-based teaching is a cluster of similar teaching approaches for helping students develop habits of thought as they learn from experience [31]. Drawing on cognitive science, Thomas et al. [32] argued that learning through cases helps students organize information in a way that can be recalled in particular situations, gain experience that cannot be acquired in other ways and make visible their clinical reasoning processes. Others promote problem-based learning, designed around particular health problems, using a structured approach to problem identification, knowledge acquisition and problem solution [33, 34]. The use of unfolding cases in the classroom highlights the changes in a clinical situation over time or as the case unfolds [35, 36]. While case-based learning was gaining some traction at this time, there was little direct evidence for its effectiveness [31]. Now more than 10 years later, research on the effectiveness of case-based approaches is still somewhat limited, with few well controlled studies in any of the health disciplines [37–39].

Thistlethwaite, in her excellent review of case-based methods observed that CBL is supported by both adult learning theory and inquiry-based approaches [39]. CBL also blends aspects of cognitive and social constructivist models of learning and enables students to see the direct relevance of what they are learning. As Shulman

[40] pointed out, virtually all case-based methods share a common set of principles that generally support learning:

- Learners as active agents,
- Collaboration among learners,
- Opportunity for students "to reflectively turn around on their thoughts and actions and analyze how and why their thinking achieved certain ends" ([40], pp. 476–477).

Kassirer [41] a prominent medical education researcher maintains that developing clinical reasoning skill "is best accomplished by repeated, deliberate exposure to real cases, that case examples should be selected for their reflection of multiple aspects of clinical reasoning, and that the participation of a coach augments the experience" ([41], p. 1118).

Another factor that led to our adoption of case-based teaching was the introduction of simulation-based learning experiences (SBLE). Faculty from each campus participated in a faculty development program to train simulation specialists on each campus—a faculty member who would collaborate in the development of scenarios and lead simulation experiences for students [42]. By the time the first class of students had begun the nursing curriculum, all OCNE campuses had access to high-fidelity simulation and a beginning set of simulation scenarios. Faculty purposely designed simulation scenarios as case-based, using the practice and debriefing to support clinical judgment. Their framework for debriefing was [28] the clinical judgment model [28, 43–46].

Both high-fidelity simulation (manikins and standardized patients) and virtual computer-based simulation have enjoyed wide-spread adoption in health professions education. There is general theoretical support for use of simulation to support development of clinical reasoning [47] although the empirical evidence is somewhat limited. There is a growing consensus about the importance of systematic debriefing in promoting clinical reasoning skill, using both Tanner's clinical judgment model [43, 46] as well as the Dreifuerst "debriefing for meaningful learning" model [48–50] as systematic approaches to debriefing in simulation.

9.3.3 Use Competencies and Assessments Which Reflect Actual Nursing Practice

The competencies developed by the ONLC Education Committee were widely endorsed by educators, nurse executives, and nurses in practice. Through our work on various pedagogical models, we revised the competencies to reflect our emphasis on deep learning while retaining the focus on clinical practice requirements for nurses with a baccalaureate degree. We defined a competency as a broad statement that describes the knowledge, attitudes, and skills that learners should be able to perform or demonstrate in a variety of settings following completion of the baccalaureate nursing program. A hallmark of the OCNE competency model is a *spiral*

approach to teaching and learning. Competencies are revisited throughout the curriculum with increasing levels of difficulty and with new learning building on previous learning. For instance, students might *engage in learning* activities for interpersonal competencies in a specific module but they will *apply* their knowledge of good communication practices in many places throughout the curriculum. A simulation experience in the late second year of the nursing program might be directed toward the application of multiple competencies in specific nursing skills, teamwork, interpersonal skills, and clinical judgment. As students progress upwards on the curriculum spiral their experiences become more complex and challenging, weaving in a more rigorous integration of competencies [51].

The current competencies (Table 9.1) show the influence of the Understanding by Design Model (UBD) [16]. They answer the first question in the UBD model—"What is worthy and requiring of deep understanding?" and clearly reflect our renewed definition of nursing. The competencies recognize that effective nursing requires a person with particular values, attitudes, and practices, as well as with particular knowledge and skills needed in providing nursing care. Accordingly, there are two categories of competencies: professional competencies and nursing care competencies. Professional competencies define the values, attitudes, and practices that competent nurses embody and may share with members of other professions. Nursing care competencies define relationship capabilities that nurses need to work with patients/clients and colleagues, the knowledge and skills of practicing the discipline and competencies that encompass understanding of the broader health care system. In all cases, the patient/client is a member of the health care team, and is defined as the recipient of care, considered an active participant in care, and includes the individual, family, or community. A competent nurse provides safe care across the lifespan directed toward the goals of helping patient/client (individuals, families, or communities) promote health, recover from acute illness and/or manage a chronic illness, and support a peaceful and comfortable death.

Each of the ten competencies has several dimensions; for example, competency 1, nursing core values, has three dimensions: code of ethics, use of code of ethics in ethical questions, and legal scope of practice. Competency 7 has four dimensions on communication: therapeutic communication, health team communication, social and cultural influences on communication, and health teaching. These dimensions are reflected in benchmarks and course outcomes, making it possible to describe competency attainment at the end of each year of the 3-year nursing curriculum and at the end of each major course.

9.3.4 Define Clear Evidence of Deep Understanding: Benchmarks and Rubrics

Wiggins and McTigue's [16] question (2) "What is evidence of understanding?" mandates the development of assessment criteria to determine if understanding has been achieved. Following the advice of our consultants we defined performance levels, or benchmarks, for each of the ten competencies and their dimensions.

Table 9.1 Oregon Consortium for Nursing Education (OCNE)

Curriculum Competencies
Professional Competencies
1. A competent nurse **bases personal and professional actions on a set of shared core nursing values** through the understanding that...
1.1 Nursing is a humanitarian profession based on a set of core nursing values. As affirmed in the ANA Code of Ethics and other nursing literature, these values include social justice, caring, advocacy, protection of patient autonomy, prevention of harm, respect for self and others, collegiality, authority, accountability, responsibility for nursing practice, and ethical behavior.
1.2 Ethical dilemmas are encountered in clinical practice. Nurses are obligated to notice, interpret, respond and reflect on these dilemmas using ethical principles and frameworks as a guideline.
1.3 Nursing has a legal scope of practice and professionally defined standards that enable nurses to practice at the top of their license.
2. A competent nurse **uses reflection, self-analysis, and self-care to develop insight** through the understanding that...
2.1 Ongoing reflection, critical examination, and evaluation of one's professional practice and personal life improve nursing practice.
2.2 Reflection and self-analysis encourage self-awareness, self-regulation, and self-care.
3. A competent nurse **engages in intentional learning** with the understanding that...
3.1 Engaging in intentional learning develops self-awareness of the goals, processes, and potential actions of this learning and its effects on patient/client care.
3.2 Purposely seeking new, relevant knowledge and skills guide best practice development, supporting safe and effective patient/client care.
3.3 Integrative thinking establishes connections between seemingly disparate information and sources of information that will be applicable in any situation.
3.4 Using an array of communication and information technologies enhances continuous, intentional learning.
4. A competent nurse **demonstrates leadership in nursing and health care** through the understanding that...
4.1 Nurses take a leadership role to meet patient/client needs, improve the health care system, and facilitate community problem solving.
4.2 Nurses effectively use management principles, strategies, and tools to improve systems, processes, and outcomes.
4.3 Nurses are skilled in working with assistive nursing personnel including the assignment/delegation of responsibilities and supervision.
5. A competent nurse **collaborates as part of a health care team** through the understanding that...
5.1 The patient/client is an essential member of the health care team.
5.2 Successful health care depends on a team effort, and collaboration with others in a collegial team is essential for success in serving patients/clients.
5.3 Learning and growth depend on providing, receiving, and using feedback in a constructive manner.
5.4 Supporting the development of colleagues creates a just culture in the health care setting.

Table 9.1 (continued)

Curriculum Competencies
6. A competent nurse **is able to practice within, utilize, and contribute to all health care systems** through the understanding that... 6.1 Components of the system must be considered when coordinating or planning care and when engaging with the multidisciplinary team. 6.2 Improvements to health care utilize information technology for the collection and analysis of data. 6.3 System-level thinking is required in the development and implementation of health policy to achieve health equity. 6.4 Improving health literacy and expanding access to health care are essential to improve outcomes. 6.5 Responsible management and utilization of health care resources is essential.
Nursing Care Competencies
7. A competent nurse **practices a relationship-centered approach** through the understanding that... 7.1 Patient/Client-centered care is based on developing mutual trust and respect for the autonomy of the patient/client. 7.2 Culture, history, health disparities, family, and community must be considered in a patient/client-centered approach.
8. A competent nurse **communicates effectively** through the understanding that... 8.1 Therapeutic communication establishes a caring relationship with patients/clients, families, and/or communities to advocate, develop, and facilitate care. 8.2 Accurate and complete communication with both patients/clients and the health care team is essential to ensure patient safety and provide for comprehensive continuity of care. 8.3 Successful communication requires attention to social and cultural influences and the use of appropriate communication modalities and technologies. 8.4 Health teaching requires attention to the patient's/client's and family's health literacy, cognitive and physical abilities, as well as community values and beliefs.
9. A competent nurse **makes sound clinical judgments** through the understanding that... 9.1 Nurses use a variety of frameworks, classification systems, and information management systems to organize data and knowledge for clinical judgment. 9.2 Nursing judgment is an iterative process of noticing, interpreting, responding, and reflecting. 9.3 Noticing, interpreting, and responding require use of best available evidence, a deep understanding of the patient/client experiences and cultural influences, recognition of contextual factors as well as one's own biases that may influence judgments and sound clinical reasoning. 9.4 Clinical judgment involves the accurate performance of cognitive, affective, and psychomotor skills in the delivery of care while maintaining safety of the patient/client, family, community, environment, and self.
10. A competent nurse, **locates, evaluates, and uses the best available evidence** through the understanding that... 10.1. Legitimate sources of evidence for decision-making include research evidence, standards of care, community perspectives, a deep understanding of patient/client experience and preferences, and practical wisdom gained from experience and participation in professional organizations. 10.2. Knowledge from the biological, social, medical, public health, and nursing sciences is constantly evolving. 10.3 Best practice in nursing is continuously modified.

Benchmarks are specified for the end of each of the 3 years of the nursing curriculum. It is expected that students across the consortium will demonstrate achievement of the benchmarks in order progress to the next level of the curriculum. We developed a rubric for each benchmark, an assessment tool designed to convey performance expectations, provide systematic feedback to students about their performance, and promote student learning. The rubrics can be used alone or in combination, depending on the demands of the performance task and the level of the student. Each rubric has several components: (1) a statement of the competency to be demonstrated; (2) dimensions which lay out the parts of the competency which are vital to successful achievement; (3) descriptions of the dimensions at each level of performance.

These benchmarks are reflected in course outcomes, as they would be demonstrated for the particular focus of care. Rubrics are used as clinical evaluation tools and are reflected in grading rubrics for specific assignments such as written term papers, case analyses, concept maps, and reflective journals. An example of a benchmark rubric for competency 1 is in Table 9.2.

In addition to meeting the level benchmarks associated with specific competencies, students are required to provide safe care according to established standards within the RN scope of practice and adhere to individual schools' code of conduct and policies as outlined in student handbooks. Students are expected to integrate all competencies into their practice, as they are relevant to the situations and as they achieve higher levels of benchmarks. Integration is a broad reaching platform where students combine all ten competencies, as they are relevant to the situation, into their nursing practice and affect the plan of care for clients, populations, and systems.

9.3.5 Organizing the Content and Coursework Around a Framework

As we completed the competencies, it was clear that we needed a framework for the selection, organization, and sequencing of content. Historically, nursing curricula began with a "foundations" or "fundamentals" course, followed by courses identified by traditional specialty areas—medical-surgical nursing (often called Adult Health and Illness), pediatric nursing, maternity nursing (these latter often placed together in a course called family nursing), mental health nursing, community health nursing. Other content was placed in separate courses often with no associated clinical course, e.g., health assessment, nursing ethics, research in nursing, leadership in nursing.

Learning science [52] tells us that to "develop competence in an area of inquiry, students must (a) have a deep foundation of factual knowledge (b) understand facts and ideas in the context of a conceptual framework and (c) organize knowledge in a way that facilitates retrieval and application" ([52], p. 18). We needed to find or develop a framework for organizing clinical content that created space for teaching

Table 9.2 Example of a Benchmark Rubric

Dimension	Level III At completion of NRS 425/426. (If not indicated, same as AAS completion)	Level II End of winter term of second year of OCNE curriculum	Level I End of first year of OCNE curriculum
ANA code of ethics (used as a reflection of nursing's shared core values)	Integrates professional values with personal values Independently incorporates each provision of the ANA Code of Ethics in practice Works with colleagues to create a shared climate for core values	Incorporates most of the provisions of the ANA Code of Ethics into practice. May require prompting	Articulates the nine provisions in the ANA Code of Ethics; Self-assesses own performance in relation to each provision. Begins to integrate into care
Integration of ethical principles and frameworks Noticing/ recognizing ethical dilemmas inherent in clinical situations	Works with team members to assure that patient's rights are protected by institutional policies and practices. Identifies ethical principle(s) involved Identifies dilemmas in which individual rights are in conflict with the greater good	Identifies when clinical practices and protocols may be at odds with individual patient's rights. Articulates dilemmas, with pertinent facts	Recognizes when own values are at odds with values of client and/or family. Recognizes biases that may be introduced into clinical reasoning as a result of personal values. Identifies obvious ethical dilemmas in which there are two or more viable options
Interpretation and responding to dilemmas	Consistently facilitates discussion among patients, families and other stakeholders to consider courses of actions and consequences and to reach decisions. Helps families work though the emotional aspects of ethical dilemmas	Usually Identifies stakeholders in ethical dilemmas Can apply ethical principles to identify choices, possible consequences	Occasionally seeks assistance from colleagues or instructor to interpret own biases and values and their influence. Can articulate ethical principles but may not see application in particular context

about emerging health care needs, concepts, and practices, and would help students organize knowledge as they learned it.

In a 2003 report as part of the IOM series on safety and quality, the Institute of Medicine selected 20 priority areas to focus on for quality improvement, based on criteria such as prevalence, a measure called "disability-adjusted life years" (DALYs) which combines years of life lost as a result of premature death with years lived with disability, ([7], p. 34) cost of care, improvability. They organized these priority areas into a framework that represented (1) the full spectrum of health care,

from preventive and acute care to chronic illness management, palliative and end-of-life care, (2) care provided for a variety of populations representing Americans of all ages and demographic groups, including individuals, families, and populations, and (3) care delivery in a variety of settings by a variety of health care practitioners including nurses. The resulting framework includes preventive care, chronic illness, behavioral health, acute care (inpatient/surgical care), and end-of-life/palliative care. Behavioral health, one of the key priority areas is integrated into each of the clinical courses; students are likely to care for patients in these clinical settings with behavioral health issues. Clinical experiences that focus solely on mental health and psychiatric disorders are extremely limited. The IOM framework also recognized cross-cutting systems issues which would need to be addressed to realize any significant improvement in care, such as public health and leadership in health care systems.

The OCNE curriculum committee adopted this framework for the organization of our curriculum. We reasoned that many of the prevalent and emerging health care needs which needed attention in the nursing curriculum were easily addressed by this framework. There is clearly a growing knowledge base in health promotion, chronic illness management, and palliative care—theories and research which guide nursing practice. Having courses with these foci would provide a context for extending learning about evidence-based practice. Arguably practices in nursing differ by the focus of care; for example, when one's care is directed toward disease prevention and health promotion, practices will differ than when the focus is on recovery from acute illness. It will be shaped by the client's health literacy, goals for care and participation in shared decision making, aspects less likely to be the focus of nursing in the acute care setting. There are common concepts within each focus that apply across age groups, as well as practices with a common goal—in disease prevention, recovery from illness.

The curriculum plan is shown in Table 9.3. There are five courses organized around these foci of care. The first course is Foundations of Nursing: Health Promotion, a combined didactic and clinical course. Using the benchmarks, together with their advanced knowledge of health promotion concepts and practices, and prevalence data regarding common preventable illnesses, faculty developed course descriptions and specific course outcomes. For example, the course description for Foundations: Health Promotion, followed by two of the course outcomes is in Table 9.4. Other courses are developed in a similar fashion. Course descriptions highlight key concepts to be learned, while course outcomes reflect the benchmarks as applied to the particular focus of care.

We eliminated the traditional "foundations of nursing course," instead favoring the teaching of basic skills and concepts, including health assessment skills, in the context in which they would be used. We learned from studies [24, 53] of neophyte nurses that health assessment was often viewed as another task to be completed, rather than as a means of getting important information relevant for the plan of care. Thus by combining contextually appropriate clinical and assessment skills, beginning skill in clinical judgment and knowledge specific for the focus of care (e.g.,

Table 9.3 OCNE nursing curriculum for OHSU nursing students

Prerequisite year		
Sophomore year (first year, all students)		
NRS 110/210: Foundations of Nursing Health Promotion Bi 234 Microbiology	*NRS 111/211: Foundations in Chronic Illness I* NRS 232: Pathophysiology I NRS 230: Pharmacology I	*NRS 112/212: Foundations in Acute Care I* NRS 233: Pathophysiology II NRS 231: Pharmacology II
Junior year (second year, OHSU)		
NRS 222/322: Nursing in Acute Care II, End of Life General electives	*NRS 221/321: Nursing in Chronic Illness II, End of Life* General electives	*NRS 410:Population-Based Care* NRS 411: Epidemiology
Senior year—third year, OHSU students)		
NRS 412: Leadership and Outcomes Management General Electives	*NRS 424: Integrative Practicum I* NRS 424A-H: Population Focus Selective Upper division non-nursing electives	*NRS 425: Integrative Practicum II* NRS 425A-H: Population Focus Selective Upper division non-nursing electives

Sequence for community college students varies from this plan. In the spring term of their second year of nursing courses, community college take their first integrative practicum. They then graduate and are eligible to take the RN licensure exam

When they transition to an OHSU campus or enroll in the online program, students take Population-based care & Epidemiology

Followed by Leadership and Outcomes Management in the winter, then the second Integrative Practicum in the spring

Table 9.4 Sample course description and outcomes for first course in nursing curriculum: health promotion

Course Description: The emphasis on health promotion across the life span includes learning about self-health as well as patient health practices. To support self and patient health practices, students learn to access research evidence about healthy lifestyle patterns and risk factors for disease/illness, apply growth and development theory, interview patients in a culturally sensitive manner, work as members of a multidisciplinary team giving and receiving feedback about performance, and use reflective thinking about their practice as nursing students. Populations studied in the course include children, adults, older adults, and the family experiencing a normal pregnancy. Includes classroom and clinical learning experiences. The clinical portion of the course includes practice with therapeutic communication skills and selected core nursing skills identified in the OCNE Core Nursing Skills document.'
Two course outcomes: Conduct a culturally and age appropriate health assessment, and interpret health data, such as screening for biological and psychosocial health risks, evidence of safe and healthy habits, developmental tasks and vulnerabilities Use effective communication to establish a therapeutic patient-centered relationship and advocate for a health behavior change based on assessment of health risks

health promotion), we expected that students would begin to understand that assessment is linked to the decisions they would need to make about care.

In this course, Foundations of Health Promotion, we see the beginning distribution of the traditional health assessment and fundamentals of nursing courses. Students learn basic skills associated with health promotion, such as hand washing, and administration of immunizations. Students learn to conduct a full health history and focused examination for evidence of health risks and health behaviors; in their clinical practicum, they have the opportunity to do basic health histories and health screenings across age groups. In addition, they learn basic concepts such as health behavior change, age & race specific health risks, as well as some evidence-based interventions such as motivational interviewing to support health behavior change. They have the opportunity to synthesize information from their assessment with knowledge of healthy behavior to make a judgment about an individual patient's health risks.

Each course follows this same pattern, with the course description highlighting key concepts related to the focus area, with course outcomes specifying how each benchmark is attained in the context of the focus area. To illustrate this approach further, we can examine Foundations of Care: Chronic illness. In this course students learn to conduct a health assessment relevant for patients with a chronic illness—i.e. a functional health assessment identifying the patient's and family's abilities for managing activities of daily living. They learn how to provide basic care if patient or family is unable to do so, and to teach/support the family in carrying out these functions, again contextualizing some aspects of traditional nursing fundamentals. They learn about concepts such as self-health care management and how this concept applies to patients with highly prevalent conditions such as diabetes and asthma, and including children, adolescents, adults, and older adults. In the third quarter of the first year of nursing courses, students take Foundations of Acute Care, with focus on biophysiological concepts, as well as two concepts particularly relevant for acute care: risk complications, recovery. During the first year, students also take a series of complimentary science courses: microbiology along with health promotion, a 2-quarter pharmacology and a 2-quarter pathophysiology courses, along with Foundations of Chronic Illness Care and Foundations of Acute care. Content organization in the science courses is coordinated with the concurrent clinical nursing courses.

In the second year of the nursing curriculum, students take more advanced courses in chronic illness and in acute illness, each with greater emphasis on palliative and end-of-life care. These courses include theory and clinical experiences in family caregiving, transitions, and care coordination. In the last course of the second year, students enroll in Population-Based Care, picking up concepts learned through each of the preceding courses and applying them to care of populations. Their clinical experiences are in community-based health facilities, many of which serve houseless populations. They work on public health initiatives that support health promotion at the community level and learn to conduct a community level assessment. In addition to the population-based course, they take another supporting science course, particularly relevant in these times: Epidemiology.

In the final year of the nursing curriculum, students complete a course in Nursing Leadership in Health Care Delivery Systems which also includes both classroom and clinical learning experiences. They learn concepts related to leadership, management, delegation, collaboration, team decision making, interprofessional collaboration and develop beginning skills in using key quality and safety indicators to provide evidence for a practice improvement.

The last two quarters of the nursing curriculum, or a total of 20 weeks, are an Integrative Practicum which provides about 24 h/week of clinical experience in a single area of practice under the supervision of a Clinical Teaching Associate (CTA). The CTA is a staff nurse who has demonstrated clinical expertise, an aptitude for clinical teaching, and completion of an online CTA orientation that includes modules on coaching for clinical judgment and performance evaluation. A School of Nursing faculty member, with expertise in that area of practice, also provides guidance and support for the CTA. It is during this experience that the student is expected to integrate prior learning, demonstrate competency in each of the ten competencies, and show capability to assume the role of professional nurse in that setting. Full course descriptions can be found in the OHSU catalog [54].

9.3.6 Selection/Design of Learning Activities

One of the central aspects of a competency-based approach to teaching and learning is the design of learning activities, or in the UBD model, the answer to the third question: "What learning activities and teaching promote understanding, interest and excellence"?

When the curriculum committee adopted case-based teaching as a signature pedagogy for OCNE, we decided to develop several core cases—those required to be used in the curriculum or substituted with another case with similar teaching goals. Core cases, by definition, are complex, and created with the expectation that they would support deep learning about relevant content such as a highly prevalent health problem and/or important concept from middle range theory. The solution of the case always requires clinical judgment. In addition, it is expected that preparation for the case will require independently identifying and seeking relevant information to address questions raised by the case (see competency on intentional learning). Other competencies may also be involved.

Each has a teaching focus to reflect the expected learning in the case. In small group or large class discussions, the teacher guides the discussion toward attainment of the desired learning outcomes. It is not uncommon for discussion of a large case to stray afield from the learning goals. A skillful facilitator can bring the discussion back to the main points, so as not to waste valuable class time on irrelevant tangents that leave participants and teacher frustrated.

The individuals and their families represented in the cases may be followed throughout the OCNE curriculum, with a slightly different focus each time. For example, one case has three parts. The patient is a woman with metastatic breast cancer, and the case follows her through her diagnosis (focusing on communication

and interprofessional collaboration) to her outpatient experiences with chemotherapy infusions and symptom management to her end-of-life care. Sometimes parts of cases are taken up in the simulation lab, with either an acute care episode or a home visit, sometimes with the manikin and occasionally with a standardized patient [55, 56].

Faculty have developed many additional learning activities over the years, including discussion questions to accompany selected readings, summarizing a clinical practice guideline related to an aspect of care, unfolding cases used in the classroom that are interspersed with brief lectures to address students' questions as they pertain to the clinical case, interviewing a person experiencing a chronic illness. Each has selected learning goals tied to the course outcomes. OCNE faculty have published multiple examples of learning activities in the nursing education literature [56–63].

Over the first decade of OCNE, we developed a web-based platform on which faculty could search for learning activities, searching by course, competencies, population designation such as age or culture, health problem, or key concept. The use of this platform extends faculty expertise across all campuses, and we expect that it will eventually reduce faculty preparation time required for developing new learning activities.

Clinical learning activities are a second important OCNE pedagogy, in which clinical experiences are planned and designed to ensure that students attain competencies and have requisite experience with patients with highly prevalent actual or potential health problems. The notion of providing purposefully directed clinical learning experiences was a large deviation from the traditional clinical education model in use at the time. The traditional model requires placement of students in clinical sites where registered nurses practice. Students are arranged in clinical groups of eight or nine students with one clinical instructor, while staff nurses augment clinical teaching and supervision. Clinical faculty members were responsible for ensuring that students receive a valuable experience in real-world situations. High acuity in the most frequently used clinical sites—hospitals and skilled nursing facilities—short hospitals stays, staff shortages, along with the typical student assignment of total patient care for one patient, all made it extremely difficult to ensure that students would actually get both supervision and instruction needed to facilitate development of clinical reasoning. As we began to explore the possibility of creating clinical learning experiences, it became clear that many of our clinical sites were poorly aligned with learning goals. In the next section, we describe the work on redesigning clinical education, and the development of purposeful clinical learning activities [12, 64, 65].

9.4 Developing a New Clinical Education Model

The Clinical Education Redesign Group (CERG) developed the OCNE clinical education model through collaborative work with stakeholders from across the state. Thirty-two practice (nurse executives and staff nurses) and education (faculty) partners participated in the CERG.

The CERG discussed the shortage of appropriate clinical sites, the issue of "down-time' in clinical education, when students have little opportunity for new learning, the patient to whom they are assigned care has been discharged, and they are ill-prepared to take on care of a newly assigned patient. We developed the idea of a clinical education curriculum, in which we would develop clinical learning opportunities, designed to help students achieve certain competencies, develop a deeper understanding of concepts, become more skillful in basic procedures, become part of the unit culture.

The CERG also discussed the importance of total patient care, in which students have time to develop a relationship with a patient, develop interpersonal skill, begin to understand the illness experience, and a context through which to explore and develop one's professional identity [66]. The CERG agreed that there are other types of learning experiences that can occur only in the clinical setting and which promote different kinds of learning:

(1) Deepening and extending theoretical knowledge and learning how key concepts are exemplified in practice. As students are learning concepts related to the focus of care and mid-range theories, having opportunities to see the concepts and recognize their patterns in practice would comprise important experiences, (2) developing skill in clinical judgment and other habits of thought such as ethical reasoning, reflection on practice and system thinking—again each expressed in our competencies, yet with little opportunity for practice in real-life situations, (3) developing practical skills in essential nursing procedures, in which repetitive experience with feedback is required, and (4) developing an understanding of the culture of health care and nursing, roles of team members, ways of functioning on an interprofessional team, which may require an immersion experience during which learners can be viewed as legitimate members of the health care team.

The CERG developed a typology of clinical learning activities which represent these different approaches to learning (Table 9.5). The model they developed aligns clinical learning experiences with the students' developmental level.

In early clinical learning, through the first year of the nursing curriculum, concept-based, case-based, and intervention skill-based elements are dominant [65]. Concept-based learning focuses on a concept used as foundational building blocks to aid in developing pattern recognition and clinical judgment [57, 67, 68]. Faculty develop and implement case-based learning experiences focused on common salient clinical exemplars, often delivered through simulation, to enhance developing clinical judgment, communication, and teamwork. Intervention/skill-based learning occurs through repetition of psychomotor skills, as well as skill building in assessment and communication.

During mid-level clinical experiences, beginning toward the end of the first year, focused direct patient care is used as an activity for the student to gain progressive experience in the actual delivery of nursing care in acute care, transitional care, and community settings. Integrative clinical experiences dominate in late clinical learning and provide an opportunity for the student to synthesize elements of prior learning into an authentic clinical practice situation and begin the transition into independent professional practice. The OCNE clinical education model considers

Table 9.5 OCNE clinical education model: purpose, characteristics, and considerations for each element of the model

Element	Purpose	Defining characteristics	Considerations
Concept-based learning experiences (CBLA)	Support student learning in the development of pattern recognition an essential antecedent in clinical reasoning and judgment—Students learn what to notice and interpret	Students study an issue at hand in an authentic clinical learning through involvement with several patients/clients experiencing the same health problem or illness. Similarities and differences are explored through performing assessment and study of the patient's history, treatments, and response. Faculty help students compare and contrast of assessment and findings and help students identify what is salient	Students are not responsible for care of the patient. They are expected to respond appropriately and report to any safety concerns that may be identified while examining or interviewing the patient. Faculty must clearly communicate with staff regarding the purpose, nature of the learning activity, and student accountability for patient care activities
Case-based/ simulation experiences	Enhance theoretical understanding through practice and reflection. Support the development of clinical reasoning/ judgment Practice contextual application of skills—such as psychomotor, communication, and teamwork	Present cases depicting authentic and common clinical problems they encounter in practice. Cases are created to unfold so students learn to notice both obvious and subtle clinical changes as they interpret findings, respond and adjust responses according to patient response. Reflection on action is a critical component of the experience through debriefing	Cases must be carefully designed to align with theoretical learning. International Nursing Association for Clinical Simulation and Learning (INASCL) to design, provide evidence-based standards to guide implement and debrief simulation/case-based learning
Intervention skill-based experiences	Builds proficiency in the know-how and the know-why of nursing practiced	Skills addressed include but are not limited to psychomotor skills, communication, teaching, motivational interviewing, providing a SBAR report and leadership skill such delegation. Skill-based experiences are introduced in the laboratory and students are provided opportunity to obtain mastery through coaching and feedback	Remastery may need to occur when there is a gap between mastery in lab and contextual application in patient care settings

Table 9.5 (continued)

Element	Purpose	Defining characteristics	Considerations
Focused-Direct Patient care	Enables student to become proficient in providing care in authentic clinical settings and build relationships with the patient and other members of the health care team	Differs from total-patient care in that students engage in activities targeted at helping them achieve the course outcomes emphasizing the application of self as a therapeutic agent. Delegation and teamwork are emphasized providing actions focused on the duties and accountability of the nurse students practice clinical judgment in the context of an organizational culture as they assume the role as a professional nurse	Students and faculty must communicate and collaborate clearly with staff regarding patient assignment and focus of the care student will be providing. Relevant patient care data and response to treatment must be reported to the patient's assigned nurse
Integrative experiences	Students apply all elements of prior learning in a specific clinical context. Students learn to practice while experiencing, rules, norms, and culture of an organization	Students are assigned to work with a registered nurse and provide care with coaching and direction of the nurse preceptor/clinical teaching associate (CTA). Integrative practicums are of sufficient length to become immersed in the clinical environment and integrate into the setting as a member of the health care team. Students become more independent as the integrative practicum progresses and s/he synthesizes prior learning	Preceptor/CTA must be trained to assure the student progress in mastery of the OCNE competencies throughout the integrated practicum. Preceptor/CTA training must include Foundational understanding of the OCNE curriculum, use of Benchmarks for assessing progress, coaching and process for communicating with faculty responsible for student learning

learners' development as they progress through the curriculum. Each clinical activity is designed to build upon previous experiences and is implemented and evaluated assuring students meet course outcomes, essential concepts, and program competencies.

The clinical education typology is being widely used throughout the campuses.

However, there was and continues to be some hesitancy on the part of faculty to substitute total patient care experiences with clinical learning activities. Depending on the campus, they may be used by individual faculty when, for example, the patient census is too low for students to get adequate direct care experiences. On most campuses, simulation and skills lab are used regularly to achieve the specific required outcomes of learning. Concept-based learning activities are also used

systematically, particularly early in the program, during health promotion and chronic illness when relevant clinical experiences are limited. Like other learning experiences, clinical learning activities such as simulation scenarios and concept-based learning activities are catalogued on the web-based, learning activities platform to be used by faculty across OCNE.

9.5 Development of Structure and Processes to Support the Shared Curriculum

The development of OCNE as an organization, the design of the curriculum and implementation of a comprehensive evaluation of the initiative was supported by a combination of foundation grants, local, state, and federal funding. The permanent post-grant structure, begun in 2009 embraced the attributes of the established collaborative partnership to create a stable and responsive organizational structure and process [69].

9.5.1 Collaborative Leadership

The OCNE leadership team includes two co-directors, one with a primary appointment from a partner community college, the other from one of the university's five campus. The full-time program manager leads and supports the operational work of Coordinating Council and committees. In addition, the program manager facilitates communication among and between the council and committees and is key to implementing the strategic plan.

The OCNE Coordinating Council includes representation from the director, dean, or associate dean from each of the partner campuses and provides and monitors implementation of the consortium strategic and operational plan. A formal governmental agreement and operating guidelines describe the roles, boundaries, and responsibilities of partner organizations, consortium leaders, and Coordinating Council and committees.

The OCNE leadership team oversees and guides the organizations operations. Strategic initiatives and operations are provided primarily through three committees that work interdependently creating a systematic process for assessing fidelity and promoting adherence to the formal shared curriculum agreements. The three committees–Curriculum, Research and Evaluation and Collaborative Learning Committee—are co-chaired by one faculty from community college and another from a university campus.

9.5.2 Continuous Quality Improvement

The Coordinating Council and committees carry out the continuous quality improvement activities assuring the shared curriculum is up-to-date. Review of curriculum

documents including the competencies, benchmarks, course descriptions and outcomes, and essential content and concept course guides is examined and revised using a 3-year staggered review plan. For example, The Research and Evaluation committee evaluates course evaluations and faculty feedback for select courses 1 year and the following year the Curriculum Committee reviews the findings and recommendations. The Curriculum Committee then develops proposed changes integrating the findings from the Research and Evaluation committee with careful examination of state and national data, studies, and documents addressing the current and predicted future trends in health care and nursing practice. Lead faculty for a particular course from each campus meet at the conclusion of the term. They review the course outcomes, learning activities, and evaluation data (e.g., student performance data and student evaluations) and recommend to the curriculum committee any substantive changes needed in course. The Curriculum Committee creates and approves the final version of curriculum documents. The Coordinating Council provides the final approval assuring competencies and benchmarks align with accreditation and college or university requirements and standards. The Collaborative Learning Committee creates and implements faculty development activities needed to address new content and processes resulting from the recent curriculum changes. They also plan the new faculty orientation. Learning activities are shared on a collaborative software platform and the Collaborative Learning Committee monitors the contributions from the partners and encourages sharing and communication to leverage resources across all partner campuses. The Collaborative Learning Committee also plans the annual all faculty meeting and professional development conference. The annual meeting and conference address emerging educational and practice trends, aligning the agenda and learning opportunities with recent curriculum changes.

This continuous quality improvement process ensures that students are prepared to address the health needs of their patients. Faculty engage with current research and practice in health care systems and the learning sciences. Because faculties from all partner schools are involved in this ongoing process, important perspectives from diverse communities across the state are included.

9.6 Summary

This chapter has described the processes used to develop the OCNE innovative, competency-based curriculum. Beginning in 2002, a representative group of faculty members, staff nurses, and nurse executives met to develop specific actions in response to two strategic directions developed by nursing leadership: (1) double enrollment in Oregon nursing programs; (2) transform nursing education so that it more closely aligns with emerging health care needs of Oregonians. This group developed a preliminary set of competencies which would describe the new nurse. Given the limited resources in the state for expanding enrollment, they also proposed the development of a consortium, the Oregon Consortium for Nursing Education. With funding from multiple sources, a 35-member curriculum

committee, representing all full partners of OCNE set to work on developing what would become a shared baccalaureate curriculum taught on all campuses of the consortium. Through work with consultants and extensive reading and discussions, faculty agreed on several principles drawn from learning science and nursing education research that would guide the curriculum development. They revised the ten competencies to reflect our focus on deep learning and from the Institute of Medicine's reports on quality of health care, they selected an organizing framework for course development and sequencing. The curriculum was thus organized around foci of care with courses addressing health promotion, chronic illness management, acute care, end-of-life care, population-based care and leadership and outcomes management, each with supporting clinical experience. The program of study concludes with a two-quarter integrative practicum during the student practices in an area of choice, with guidance from a staff nurse selected to serve as a clinical teaching associate. Faculty adopted two major signature pedagogies: case-based learning and clinical learning experiences. The faculty also have made extensive use of newer technologies including high-fidelity, manikin-based simulation (as a form of case-based learning), and a web-based platform to store and retrieve learning activities associate with specific courses, competencies, or concepts. They have developed an ongoing quality improvement process for the curriculum, and have completed a comprehensive program evaluation.

OCNE has grown from an early vision of nursing education reform to a robust, dynamic collaboration that has influenced thousands of nursing students, faculty, the nursing education profession, and—by extension—patients and health systems. Through collaboration, OCNE leverages limited dollars and the expertise of nurse educators throughout the state to provide access for students in every corner of Oregon to an efficient and effective pathway for high quality nursing education. The value of OCNE has come into bold relief during the pandemic of 2020, and the resulting urgent changes needed in nursing education. Faculty have used the collaborative foundation to implement online learning activities, screen-based simulation, and other distant clinical experiences. OCNE campuses have shared faculty and learning activities, as well as successes and struggles as a means to maintain quality nursing education in a difficult situation. OCNE must continue to operate efficiently, build, and maintain robust partnerships, and remain a sustainable and dynamic organization to ensure the citizens of Oregon continue to benefit from OCNE's continued ability to deliver on its original promise—to leverage collective expertise and resources to prepare a well-qualified nursing workforce to meet the health care needs of Oregonians across the state.

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Development of a European Curriculum for Family and Community Nurses

10

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I. Darmann-Finck, K. Reiber (eds.), *Development, Implementation and Evaluation of Curricula in Nursing and Midwifery Education*,
https://doi.org/10.1007/978-3-030-78181-1_10

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10.1 Introduction

Intensifying and improving education in the nursing field is definitely a need in Europe, along with a more specialized and homogenous nursing educational provision, which is instead quite diversified across countries. The professional profile of the "Family and Community Nurse" is no exception and would definitely benefit from a serious (re-)definition of its specialized educational offer.

The Family and Community Nurse (FCN) has been recognized as a key factor in the implementation of innovative healthcare models centred on Primary Health Care (PHC) (1). As a matter of fact, strengthening PHC is advocated as the direction we should take, as it is stated in the recent Declaration of Astana (2018) [1], unanimously endorsed by all the World Health Organization (WHO) Member States:

> "… strengthening Primary Health Care (PHC) is the most inclusive, effective and efficient approach to enhance people's physical and mental health, as well as social well-being, and that PHC is a cornerstone of a sustainable health system for universal health coverage (UHC) and health-related Sustainable Development Goals" (1p5).

An essential milestone of PHC is the Family and Community Nurse, who is required to play a new and crucial role, especially in supporting the ageing process, which is a long-term trend and is definitely one of the biggest challenges of our society. Such a pivotal role for FCN is recognized by both existing research in the field, as well as by the most recent international and EU reports and recommendations regarding the health context [2–5].

In particular, FCN is identified with first-contact, accessible, continued, comprehensive and coordinated care on the territory, acting as an effective means to face the challenges posed by population ageing in the EU, thus providing a gateway between the community and the health systems.

Some studies have demonstrated the centrality of FCN to supporting people with dementia and their families [6]. Moreover, according to Wilkes et al. [7], FNCs can work in multidisciplinary teams to manage clients with chronic conditions, by covering different domains, including advocate, supporter, coordinator, educator, team

member and assessor. Other studies have also pointed out that community-based care is a cost-efficient and cost-effective alternative to hospital-centred care [8, 9].

The importance of decreasing hospitalization has been very clearly demonstrated also by the recent COVID-19 outbreak: in this unfortunate situation, it has become definitely evident how centralized healthcare is unable to fully respond to a spike in the number of patients requiring care [10]. Effective and well-distributed PHC can help relieve some of the pressure on hospitals and health centers while still catering to the needs of the population. Thus FCN professionals, if adequately trained, can play a major role in facing similar emergencies in the future. This has been clearly recognized, for example, in Italy, where the government has recently issued a new law, formalizing the FCN profile at national level, in response to the need of managing "phase 2" of the emergency, as well as the subsequent ones.

Although the FCN's role is unanimously advocated by the main world organizations and in the scientific literature, and despite the fact these professionals already exist in several European countries, to date there is no standardized professional profile for this important figure, and the situation in terms of educational provision to become FCN is quite scattered across Europe. In the effort to address this gap, the ENhANCE (EuropeaN curriculum for fAmily aNd Community nursE) project, recently funded within the Erasmus+ Programme, aims to elaborate a European Curriculum to become Family and Community Nurse.

In this contribution, we describe the development process that led the ENhANCE project to define a shared European Curriculum devoted for this key stakeholder. Results of evaluation are also reported and discussed to highlight strong points and weakness of the overall experience and possibly outline future directions for Curriculum development in this and other similar contexts.

10.2 Overall Method for Curriculum Development

In ENhANCE the development process that led to the definition of the European Curriculum, encompassed four main steps:

1. studying the current educational provision for FCN in Europe;
2. profiling FCN;
3. actual Curriculum development;
4. instantiation into national curricula and validation through piloting.

The steps are described in the following sections.

10.2.1 Studying the Current Educational Provision for FCN in Europe

In Europe, there are a number of professionals operating in the field of family and community nursing, but they are often labelled in different ways and—even more importantly—the educational provision is quite scattered and diversified to train these figures.

As a consequence, this stage encompassed the analysis of existing curricula for FCN (or similar professionals in the field of family and community nursing) in 20 European countries and had the aim of laying a common basis for the European Curriculum that could meet the national needs, as well as being compliant with the current training provision and health systems in the various countries.

As a general consideration, existing curricula in Europe for FCN present significant differences in terms of the qualification they offer: some countries do not offer any specialization in Family and Community Nursing (e.g., Romania), some others offer courses as part of post-graduate studies (e.g., Greece), others offer training programs (e.g., Slovenia and France) and others offer a specialization in Family and Community Nursing as Master Programs (e.g., in Portugal). The great majority are post-graduate master courses (European Qualifications Framework—EQF—Level 7) for already qualified registered nurses. Nevertheless, in some countries, community nursing is a training program integrated in the Bachelor of Nursing (e.g., The Netherlands), or a 1-year program after the bachelor degree that is recognized at the same level of basic studies.

The analysis of the curricula brought to light some topics that seem to be particularly valuable and thus should be dealt with in the FCN curriculum: systems theory; caregiver coping and resilience strategies; principles of chronic disease and frailty indicators in older people; epidemiology of chronic diseases; pharmacology; dealing with the loss of autonomy; ergonomic household modifications; nutrition in older people; dealing with cases of violence against vulnerable people in homes; English language competences; reproductive health; principles of health economics; introduction to social marketing in health; migration and human rights; advance healthcare directives; addressing the needs of informal carers.

Most of the analysed courses last 1500 h (60 European Credit Transfer and Accumulation System—ECTS) in a period of 12 months, and mainly include 50% of theory and 50% of practice in the community setting. Core modules usually last from 1 month to 3 months. Many courses offer online (or blended) modules, which mainly focus on the theoretical aspects (knowledge basis) of Family and Community Nursing. Some courses include work practice for which between 5 and 10 ECTS credits are usually recognized.

Some good practices were identified in terms of assessment procedure (e.g., mid-term assessment), course evaluation (evaluation of nurses' satisfaction at the end of the training program) and flexibility. As to this last aspect, some courses/programs let the students free to choose between part-time and full time courses; another example of good practice is to offer students the possibility to complete just a part of the FCN curriculum (e.g., 2 modules) and have it recognized as a proficiency course, and then complete the rest of the curriculum later.

Work-Based Learning (WBL) in FCN is quite fragmented as witnessed by the numerous different initiatives in the field of FCN specializations. WBL can take various forms, such as apprenticeship, stage, internship and others, depending on national rules and training contexts.

In terms of teaching/learning approaches, it seems there is a tendency to alternate traditional teaching methods with more active learning approaches. In particular,

along with lectures that are usually aimed to tackle theoretical aspects, practical sessions are also foreseen. These practical sessions are usually structured as either:

- Collaborative learning approaches and practice sharing activities: students are typically divided in groups and are proposed team work with different strategies, such as, for example, case study, problem-based learning, role-plays, critical incident, etc.
- Laboratory sessions, where role-play and simulations are proposed. Simulations are used to help students getting familiar with technical skills or with relational and communication skills.

These activities are typically aimed to make students discuss and share opinions about grounded and real cases, in such a way that they can reflect on how to best apply their theoretical knowledge into practice. Through problem-based learning activities and case studies, students are asked to share their views about how to solve a problem or to conduct an intervention and—through role-plays—they can enact real situations within a safe environment, where they learn from the feedback of their peers. To be noted, most of the times these activities take place in class, while online sessions (where they exist) are typically reserved to lectures and students' individual study of online resources. This seems to suggest that technology enhanced learning environments are somehow underused and the value of online collaboration is underestimated (or not considered at all). Moreover, it is clear that the adoption of these learning approaches is very often left to the single teacher's choice and is seldom fostered at institutional level. This seems to call for more structured and systematic approaches and for a need of training teachers about how to use these strategies in the FCN training context.

The complete results of this analysis are contained in [11]. Overall, it allowed us to determine the main characteristics and structure for the European Curriculum for FCN.

10.2.2 Profiling FCN

For the definition of a Professional Profile for the Family and Community Nurse, a review of the international documents that describe the core competencies expected by family and community nurses was conducted. The analysis of the documents confirmed that in Europe different terms are used to refer to professionals operating in the field of family and community nursing: "Family Health Nurse," "Community Nurse" and "Public Health Nurse" seem to be the most common ones, besides "Family and Community Nurse". This reflects and confirms the lack of a single framework for the Family and Community Nurse. In the end, two WHO documents were identified as a baseline, one that provided the Framework for the "Family Health Nurse" [12] and one with the "Community Nursing" Framework [13]. Based on these documents and on the above described analysis of the current educational provision, a first draft of competencies for FCNs was elaborated by the project.

Subsequently, an e-Delphi Study was conducted to collect the opinions of a panel of international experts on what the core competences of the integrated figure of the "Family and Community Nurse" should be. The panel was composed of 23 experts from 10 different countries, representing nursing academics, regulatory board members, nursing service directors and experts of family and community nursing. The e-Delphi encompassed three rounds. The complete description of the process that led to the definition of the Professional Profile is outside the scope of this paper and is contained in [14]. Below you can find the resulting list of the 28 competencies for FCN Professional Profile[1] targeting EQF LEVEL 7. Under each competence, you will find the corresponding ESCO classification of competencies for the "Advanced Nurse Practitioner". According to our profile, a FCN should be able to:

1. Use the best scientific evidence available
   Apply health sciences—Conduct research in advanced nursing care—Develop advanced health promotion strategies—Implement scientific decision-making in healthcare—Lead healthcare services changes—Lead research activities in nursing
2. Systematically document and evaluate their own practice
   Advise on healthcare users' informed consent—Adhere to organizational guidelines—Analyse the quality of care—Comply with legislation related to health care—Follow clinical guidelines—Manage information in healthcare—Use electronic health records in nursing
3. Plan, implement and assess nursing care to meet the needs of individuals, families and the community within their scope of competence
   Apply nursing care in long-term care—Apply person-centred care—Diagnose nursing care—Evaluate nursing care—Implement fundamentals of nursing—Implement nursing care—Organize home care for patients
4. Identify and assess the health status and health needs of individuals and families within the context of their cultures and communities
   Interact with healthcare users—Listen actively—Perform health assessment—Plan advanced nursing care—Promote inclusion—Respond to changing situations in healthcare
5. Provide patient education and build a therapeutic relationship with patients, informal carers and their families
   Develop a collaborative therapeutic relationship—Empathize with the healthcare user—Empower individuals, families and groups—Ensure safety of healthcare users—Provide health education
6. Work together with the multidisciplinary team to prevent disease and promote and maintain health
   Advise on healthy lifestyles—Coordinate care—Educate on the prevention of illness—Work in multidisciplinary health teams
7. Apply educational strategies to promote health and safety of individuals and families

[1] https://www.enhance-fcn.eu/competencies/

Deal with emergency care situations—Initiate life preserving measures—Advise on healthy lifestyles—Develop advanced health promotion strategies—Provide health education

8. Involve individuals and families in decisions concerning their own health and well-being

   Empower individuals, families and groups—Make clinical decisions—Promote human rights

9. Monitoring and providing long-term care to people affected by chronic and rare illnesses in the community in collaboration with other members of the multidisciplinary team

   Organize homecare for patients—Screen patients for disease risk factors—Work in multidisciplinary health teams

10. Communication competencies based on evidence in relation to a specific context

    Apply context-specific clinical competences—Interact with healthcare users—Listen actively—Respond to changing situations in healthcare

11. Promote health in individuals, families and communities

    Provide health education—Provide nursing advice on healthcare—Educate on the prevention of illness—Develop advanced health promotion strategies—Advise on healthy lifestyles

12. Mentoring students to promote the health and well-being of the community

    Mentor other health professionals—Participate in health personnel training—Promote a positive image of nursing

13. Make decisions based on professional ethical standards

    Accept own accountability—Follow clinical guidelines

14. Maintain professional and inter-professional relationships and a supportive role with colleagues to ensure that professional standards are met

    Follow clinical guidelines—Comply with quality standards related to healthcare practice

15. Multidimensional community health needs assessment to implement appropriate clinical interventions and care management

    Apply context-specific clinical competences—Apply sustainability principles in healthcare—Impact of social contexts on health—Provide treatment strategies for challenges to human health

16. Ability to negotiate healthcare with patients and their families, with the multidisciplinary team and healthcare centres

    Work in a multidisciplinary team—Work in a multicultural environment in healthcare—Solve problems in healthcare—Interact with healthcare users

17. Assess the social, cultural and economical context in which the nurse's patient lives

    Work in a multicultural environment in healthcare—Impact of social contexts on health—Apply context-specific clinical competences

18. Coordinate and be accountable for attributing community healthcare activities to support workers

    Accept own accountability—Delegate activities—Develop plans related to the transfer of care

19. Accountability for the outcomes of nursing care in individuals, families and the community

    Address problems critically—Accept own accountability—Impact of social contexts on health—Perform health assessment
20. Development of nurse leadership and decision-making skills to ensure clinical and healthcare effectiveness and appropriateness

    Adopt leadership styles in healthcare—Apply organizational techniques—Clinical decision-making at advanced practice—Contribute to high level health strategic decisions
21. Alleviate patient suffering

    Diagnose advanced nursing care—Prescribe medication—Implement nursing care— Apply person-centred care
22. Participate in the prioritization of activities of the multidisciplinary team to address problems related to health and illness

    Work in multidisciplinary health teams—Solve problems in healthcare—Respond to challenging situations in healthcare—Coordinate care
23. Set standards and evaluate the outcomes related to nursing activities in people's homes and in the community

    Analyse the quality of care—Comply with quality standards related to healthcare practice—Evaluate nursing care
24. Managing diversity and fostering inclusiveness

    Work in a multicultural environment in health care
25. Analytic assessment, cultural competence, program planning and community dimensions of practice to pursue community health promotion goals together with the community multidisciplinary team

    Work in multidisciplinary health teams—Respond to challenging situations in healthcare—Adopt leadership styles in healthcare—Develop advanced health promotion strategies
26. Manage change and act as agents for change to improve family and community nursing practice

    Lead healthcare services changes
27. Leadership and development, implementation and evaluation of policies for the family and the community for purposes of health promotion

    Adopt leadership styles in healthcare—Implement policy in healthcare practices—Inform policy makers on health-related challenges
28. Managing health promotion, education, treatment and monitoring supported by ICTs (e-Health)

    Use e-health and mobile health technologies—Have computer literacy—Prescribe advanced nursing care.

This list of core competencies clearly defines what role and fields of interventions a FCN should cover.

As it will be described later on, the 28 core competencies so defined, constituted the basis for the outline of the Learning Outcomes composing the European Curriculum for FCN.

10.2.3 The European Curriculum for FCNs

Basing on the results of the above presented stages of development, we defined the following main characteristics for the European Curriculum for FCN, i.e., the EU Curriculum for FCN needs to:

- be oriented to graduate nurses (i.e., students who have an EQF Level 6 entry level) and should target EQF Level 7, as in most European countries this is the envisaged professional development path, when one wants to get a "specialization" after the entry nursing "layer",
- award between 30 and 60 ECTS credits, as this is the typical number of credits envisaged to become "specialized nurses",
- be flexible and modular, to allow instantiation in different countries, depending on the specific health and training systems. This can be implemented for example by envisaging mandatory and optional modules thus covering less than 60 credits (in any case, min. 31),
- be innovative in terms of implementation of practice sharing and collaborative learning approaches, by taking the most also from online learning,
- encompass Work-Based Learning.

The e-Delphi and its 28 competencies allowed to derive the Learning Outcomes for FCN. In particular, the 28 competencies have been grouped into Key Activities (i.e., groups of professional competences that are necessary to perform a task relevant to the job profile). Key Activities of the Professional Profile correspond to the Units of Learning Outcomes of the FCN Curriculum. The result is that the entire Curriculum includes 53 Learning Outcomes grouped into 7 Units of Learning Outcomes.

The complete list of Learning Outcomes, grouped by the Unit they belong to, is available here: https://www.enhance-fcn.eu/wp-content/uploads/2019/11/FCN-curriculum_abstract.pdf.

According to the ECVET standards, in the Curriculum each Learning Outcome is described in terms of Knowledge, Skills and Personal and Transversal Competences, as it is illustrated in the example of Fig. 10.1.

The Curriculum is also equipped with a Designer's kit, composed of a number of tools, aimed to support the instantiation process into national curricula. These include:

- A set of instructions, user manuals and checklists to support the instantiation process (how to build the modules, how to select teaching/learning strategies and design activities, how to organize work-based learning, etc.).
- The Flexibility tool (Fig. 10.2), to select (mandatory and optional) Learning Outcomes, choose the adequate teaching/learning strategies (lecture, individual study, group work, lab, work-based learning) and assign credits to Learning Outcomes.
- The Assessment tool to choose the most adequate methods and means for the student assessment.

LO1a

Identify and assess individuals' health status and health needs

KNOWLEDGE

- Recall basic methods of epidemiological research for diseases.
- Quote the frequency of common diseases regarding certain individual, community context and time characteristics.
- Recognize and describe the needs of individuals, even in complex situations, demonstrating highly specialized knowledge about them.
- Classify the determinants of individuals' health and illness.
- Be critically aware of the concept of "frailty" and related issues and recognize frailty situations of individuals, even in complex situations
- Identify the proper standardized and validated assessment tools for individuals' health status and health needs.
- Identify possible health threats or risks for individuals within the cultural context and the targeted community.

SKILLS

- Evaluate all the dimensions (biological, mental, spiritual, social) of individuals' health status.
- Perform a specialised assessment on health status with the use of standardized and validated evaluation tools.
- Assess individuals' health needs within a specific cultural context, even in complex situations
- Detect frequent health problems of individuals within a specific cultural context.
- Collect individuals' data through observation, interview and physical examination.
- Compose a nursing report of the identified level of individuals' health status, health needs and health risks

PERSONAL AND TRANSVERSAL COMPETENCES

- Perform a highly specialized analysis of health status and health needs of individuals within a specific cultural and community context.
- Take responsibility on cooperation with individuals in order to detect health problems and assess health needs.
- Apply critical thinking to the identification of individuals' health problems.
- Demonstrate an intra and interdisciplinary team approach to detect health problems of individuals within the context of their cultures and communities.
- Compose the nursing report AUTONOMOUSLY

NOTES:

Competencies related to professional standards are addressed in LO15a

Fig. 10.1 Example of detailed description of a Learning Outcome. (Source: Alvino et al. [11])

	MANDATORY / OPTIONAL	MODULE	SUGGESTED STRATEGY: Lecture (f2f or online)	Individual study	Group work (f2f or online) (e.g.: problem based learning, case study	Lab (f2f) (e.g.: role-play, simulation, etc.)	Work based learning (f2f) (e.g.: apprenticeship, stage, internship...)	SUGGESTED LEVEL OF STUDY	ECTS[1]: Possible range of ECTS to be assigned to the LO eg.[1-2]	Assigned ECTS [1]	Assigned ECTS check cell
UoL A	NEEDS ASSESSMENT										
LO 1a	Mandatory	M1	X	X	X		X	Basic	0,5-2	2	
LO 1b	Mandatory	M1	X	X		x		Basic	0,5-2	2	
LO 1c	Mandatory	M1	x	X	x	x		Advanced	0,5-2	1	
LO 3a	Mandatory	M1	x	X				Basic	0,5-2	1	
LO 3b	Mandatory	M3	x	X			X	Basic	1-2	1	
LO 3c	Mandatory	M1	x	X			X	Basic	1-2	1	
LO 19a	Mandatory	M1	x	X	x		x	Advanced	0,5-2	2	
LO 19b	Mandatory	M1	f2	X	f2			Advanced	1-2	1	
LO 21a	Mandatory	M2	f2	X	f2			Advanced	0,5-2	1	
UoL B	DECISION MAKING PROCESS										
LO 2a	Mandatory	M2	X	X		x		Basic	0,5-2	1	
LO 2b	Mandatory	M2	x	X	x			Basic	1-2	1	
LO 11a	Mandatory	M4	f2	X	f2	x	X	Basic	0,5-2	1	
LO 22a		M3	x	X				Advanced	0,5-1	1	
LO 22b	Mandatory	M3	x	X	x	x	X	Advanced	0,5-2	1	
LO 23a	Mandatory	M2	f2	X	f2	x		Advanced	1-2	1	

Fig. 10.2 Flexibility tool. (Source: Alvino et al. [11])

10.2.4 Instantiation into National Curricula and Piloting

Up to now, the EU Curriculum has been instantiated into three national curricula, for Italy, Greece and Finland. Instantiation has followed the process described in Fig. 10.3.

This means that—taking on board the EU Curriculum and the related Designer's kit—3 VET providers have adapted it to their respective national contexts, thus deriving three different national curricula that—although having a core in common—respect their own contextual constraints.

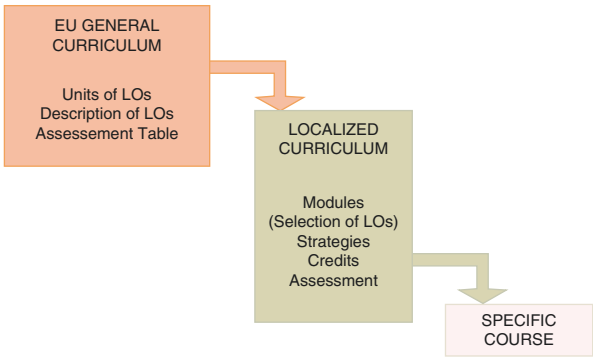

Fig. 10.3 Instantiation process and piloting. (Source: Alvino et al. [11])

In particular, the three national curricula have taken the following form:

- in Italy the curriculum takes the form of a 60 ECTS credits post-graduated course awarding EQF Level 7 delivered by the University of Genoa (UNIGE),
- in Finland it takes the form of a 30 ECTS credits specialization path, that is currently delivered by the Open University, but is recognized in the context of the Master's Degree Programme (so again EQF Level 7) by the University of Eastern Finland (UEF); starting from the next academic year, the UEF itself will start delivering directly the course within the Master's Degree Programme,
- in Greece it takes the form of a EQF Level 6 Lifelong Learning Programme course, thus not leading to EQF Level 7 and is delivered by the University of Thessaly (UTH) for 45 ECTS.

The three national curricula have been recently delivered in the respective countries through pilot courses. Due to the COVID19 outbreak, the pilot courses are still running and so we do not have complete data to present. Despite this, we should report the courses have raised a lot of interest, especially in Greece and Italy: in particular, during the recruitment phase, in Greece it was necessary to select the candidates, as the maximum allowed was 120 students and this number was achieved quite easily. In Italy the recruitment phase triggered far more interest than expected, as 10/15 students were expected, while in the end UNIGE enrolled 45. In Finland, the number of candidates was more in line with expectations; however, participants are having satisfactory levels of engagement and interest in the course contents.

10.3 Preliminary Evaluation

10.3.1 Method of Evaluation

In order to set up the evaluation process for the EU Curriculum, a literature research was conducted to find out what existing models or approaches could fit with our context. Among a number of papers, we have especially analysed [15–18]. Even if all these pieces of work are very interesting and very much fitting with the context

of our project, as they tackle the issue of developing and evaluating curricula in nurse education, nonetheless we have understood they are all oriented to situations where the curriculum is developed, enacted and then evaluated. In other words, the development and evaluation of curricula in these papers always give for granted the curricula themselves are applied (experimented/enacted/delivered) in real contexts. Thus, most of the proposed evaluation models are based on the collection of data from teachers and students (among other stakeholders) who have experimented the course(s) associated with the Curriculum under study.

In our project, though, we are experiencing quite a different situation: in particular, the European Curriculum developed—per se—is an "abstract structure" that cannot, by itself, be put in place and delivered as a course. It is only a written document which represents the baseline for the development of national curricula through the Designer's kit (as explained above). As it is, it will never become an actual course because, in order to become a real course, it will need to be transformed into a national curriculum first. This means that its evaluation cannot be based on the models proposed in most of the literature. In some way, we could uptake the notion proposed by [19] who distinguish between the "intended curriculum" (a static document, often used for policy making, etc.) versus the "enacted curriculum" (a curriculum which is reified in real course in a real context, along with the associated learning materials, etc.).

In our case, we will only have the former; thus we should acknowledge we need to conceive bespoken criteria and indicators to evaluate the European Curriculum, mainly with the aim to investigate its perceived usefulness, its perceived adequacy to the real needs of the health systems, its adherence to the FCN Professional Profile, its flexibility and adaptivity to the different national contexts, etc., but we could never investigate its direct impact in terms, for example, of students' learning outcomes, etc.

In addition to this, we decided to have an evaluation also of the Professional Profile, the national curricula, as well as the Designer's kit, in such a way to get data regarding the outcomes of each step of the development process.

In terms of stakeholders to be involved in the evaluation, in this phase we considered the following:

- VET provider designers: this group of stakeholders is peculiar, as they are the main users of the European Curriculum and direct experimenters of the Designer's kit to develop the national curricula. The aim is to collect their opinions regarding the adherence of the Curriculum to the Professional Profile, the actual needs they detect in the labour market and in their national health systems to have such a figure, etc. This will also provide additional inputs to reflect on sustainability and transferability of the EU Curriculum.
- Representatives of nurses, associations, labour market, etc.: even if not direct users of the Curriculum, collecting the opinions of these bodies is also crucial, as the Curriculum is expected to have an impact in the health labour market.

- Teachers: even if not direct users of the EU Curriculum, they are exposed to it, so it is important to collect their opinions regarding aspects such as the perceived usefulness, ease of use, adherence to the Professional Profile, etc.
- External Experts: these are experts internationally recognized in the fields of nursing science and teaching in nursing science, who are "external" to the project, but are exposed to the main project outcomes to provide their feedback and evaluation.

Overall, the indicators considered in this preliminary evaluation were the following (in brackets the indicator acronym):

- Professional profile
  - Coherence of PP with the current and future Healthcare and Social welfare contexts (PP1)
  - Coherence of PP with the current and future health labour market (PP2)
- EU Curriculum
  - Coherence of EUC Learning Outcomes with the PP competencies (EUC1)
  - Adaptivity of the EUC to own national context (EUC2)
  - Usefulness (EUC3)
  - Usability (EUC4)
  - Ability to support modularity (EUC5)
  - Ability to support practice sharing (EUC6)
  - Ability to support work-based learning (EUC7)
  - Ability to support assessment (EUC8)
  - Ability to support recognition and validation of prior formal, informal and non-formal learning (EUC9)
  - Overall satisfaction after use (EUC10)
  - Expected efficacy/impact (EUC11)
- Designer's kit
  - Usefulness (DK1)
  - Usability (DK2)
  - Clarity (DK3)
  - Overall satisfaction after use (DK4)
  - Expected efficacy/impact (DK5)
- National curricula
  - (Perceived) Usefulness (NC1)
  - (Perceived) Usability (NC2)
  - Expected efficacy/impact (NC3)

Three different questionnaires were prepared (one for each stakeholder group) always containing items to be rated with a 5-point Likert scale. The questionnaires differ in that not all the indicators were intended for all the stakeholder group. For example, items regarding the Designer's kit were only included in the VET designer's questionnaire.

10.3.2 Results of Evaluation

In the following, we report the results of a preliminary data collection phase, during which we collected opinions from representative of each stakeholder groups (6 VET provider designers, 9 representatives of nurse associations and regulatory bodies, 4 External Experts and 45 teachers). Due to concerns regarding sample size, data from VET provider designers, External Experts and nurse associations were analysed qualitatively, while data from teachers were analysed both quantitatively and qualitatively.

In terms of the quantitative analysis conducted on the teachers' data, this category of stakeholders was asked to evaluate the Professional Profile, the EU Curriculum (without indicators EUC3, EUC4, and EUC10) and the National Curriculum. In particular, teachers were asked to express their opinions regarding each indicator/item, using a 5-point Likert scale (from 1 = low to 5 = high). Responses for each indicator were tested against the median point of the scale (3) using one-sample t-tests. P-values have been corrected for multiple comparisons using Benjamini–Hochberg's correction [20]. Results are reported in Table 10.1.

As can be seen from the table, all indicators received an average evaluation well above the median point of the scale, and all differences are statistically significant, suggesting that teachers overall have a very positive view of ENhANCE project outputs.

Correlations between indicator evaluations are consistently positive, ranging 0.33–0.80 (mean 0.54, sd 0.10). The correlation plot for the questionnaire is included in Fig. 10.4. In this Figure it is possible to see the correlations between each indicator and all the others.

As could be expected, correlations are higher for indicators referring to the same output (e.g., the two indicators pertaining to the Professional Profile present the

Table 10.1 Means, standard deviations, t-tests and effect size for indicators included in the Teacher questionnaire

Indicator	Mean	SD	*t*	df	Adjusted *p*-value	Cohen's d
PP1	4.29	0.66	13.07	44	<0.001	1.95
PP2	4.24	0.68	12.29	44	<0.001	1.83
EUC1	4.24	0.68	12.29	44	<0.001	1.83
EUC2	4.29	0.55	15.76	44	<0.001	2.35
EUC5	4.07	0.50	14.44	44	<0.001	2.15
EUC6	4.24	0.57	14.64	44	<0.001	2.18
EUC7	4.33	0.56	15.86	44	<0.001	2.36
EUC8	4.27	0.54	15.75	44	<0.001	2.35
EUC9	4.11	0.61	12.19	44	<0.001	1.82
EUC11	4.13	0.55	13.88	44	<0.001	2.07
NC1	4.35	0.65	14.10	44	<0.001	2.10
NC2	4.28	0.53	17.29	44	<0.001	2.58
NC3	4.24	0.53	15.78	44	<0.001	2.35

SD standard deviation, *t* t-tests, *df* degrees of freedom

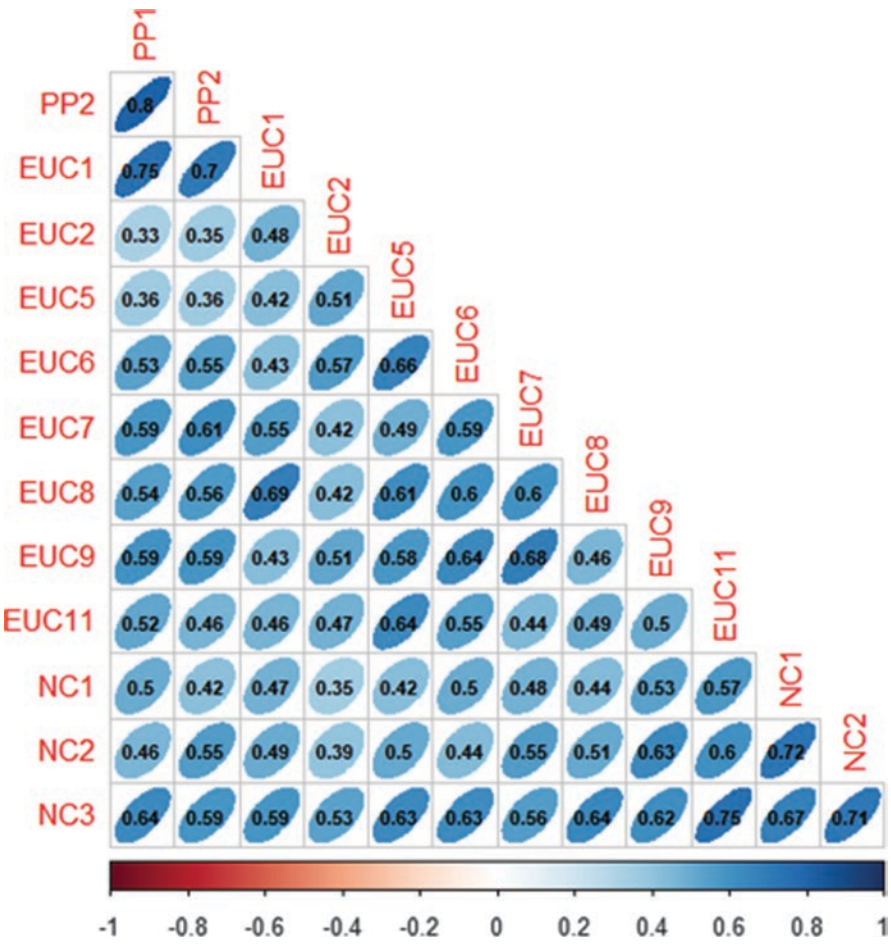

Fig. 10.4 Correlation plot for indicators in the teacher questionnaire

highest correlation of the whole questionnaire). However, a check of dimensionality conducted through parallel analysis suggests that all indicators belong to a single component.

It is especially interesting to note how NC3 ("Expected impact of the national curriculum") presents very high correlations with all the other indicators, suggesting that this aspect is somewhat central to the teachers' evaluation of the ENhANCE project outputs. In other terms, given that the NCs were the final stage of the development process, the centrality of their impact confirms the overall development process (from the PP, through the EU Curriculum, to the NCs) was sound for teachers and trusted. This is quite an important indication in terms of evaluation of the development process we put in place.

All correlations are positive; shape of the ellipses approximates the scatterplot.

Looking at the paired t-tests between indicators internally to each output, we can see how some indicators received a higher evaluation than others. Specifically, EUC5 (EU Curriculum—"Ability to support modularity") scores below EUC7 (EU Curriculum—"Ability to support work-based learning"; $t(44) = -3.32$, adj.p = 0.002, Cohen's d = 0.50). This can be explained by the fact the EU Curriculum in itself contains some indications about how to modularize the Learning Outcomes, but more specific instructions on how to make this passage are contained in the Designer's kit, so it is probably true that modularity is an aspect that can be hardly been evaluated looking at the EU Curriculum alone. EUC7 also scores higher than EUC9 (EU Curriculum—"Ability to recognize prior learning", $t(44) = 3.16$, adj.p = 0.003, Cohen's d = 0.38).

Looking at the qualitative data collected from all the stakeholders involved in this evaluation, we have detected interesting suggestions and feedback, especially regarding the Professional Profile and the European Curriculum itself.

In particular, as far as the Professional Profile, there is a general agreement the PP is adherent to both the labour market demand and the actual needs of the health systems (e.g., to reduce hospitalization). Generally speaking, we have detected teachers are more positive about the PP, while some representatives of nurse associations seem to be a little more sceptical, especially regarding changes in the demography that might modify the current scenario.

> "The family and community nurse is an important element in reducing hospitalization." (teacher #6)

> "I believe it is a figure that outside of the hospital reality will carry out educational, relational and practical interventions able to offer a territorial network for all users." (teacher #11)

> "The ageing of the European population and chronic health problems are increasing. The hospitals are conceived for the acute patients and then leave to the territory to take charge of the chronic patients. Local and home-based nursing is set to become, in the near future in Europe, the dominant phenomenon for the progressive ageing of the resident population and the increase in chronicity." (teacher #13)

> "It is coherent because the main target is to combine skills offered by nurses working in PHC and those demanded by public institutions and private services." (teacher #25)

"Because it is based on an appropriate methodological tool." (teacher #33)

"It is probably a guess… demography is one reason." (ass. repr. #2)

"Future healthcare models are moving towards people-centred & integrated care (incl. social services) as far as possible to be delivered in the community: this Professional Profile will have a key role in making contact with families in community." (ass. repr. #3)

"Highly specialized professionals are in need in the labour market, and in the health sector the need of such specialization is very noticeable." (ass. repr. #4)

"Difficult to say, because while I think it covers a lot of aspects from current curricula and was validated by a Delphi, the final selection of core competencies remained a little unclear" (ass. repr. #4)

"There are always new needs coming that we cannot predict, but it responds to the known tendencies of societal changes." (ass. repr. #5)

As far as the European Curriculum, it seems its contents have been soundly derived from the PP. Interestingly, one VET provider raises concerns about the fact that the Curriculum is too oriented to community, and not very much focused on family. This is also confirmed in one feedback from one the External Expert; this is for sure something we will need to check and improve as a result of this evaluation process. One VET provider also claims the curriculum is not innovative enough (as it does not provide sufficient ICT skills for nurses) and one teacher points out it does not sufficiently cover gerontology. Again these two aspects will need to be checked and—in case—enhanced in the final version of the Curriculum (envisaged at the end of the project).

Comments regarding the flexibility of the Curriculum, as well as its ability to support modularity, practice sharing, work-based learning and recognition of prior learning, are generally very positive. Impact of the Curriculum is also highly appreciated. Importantly, one representative of nurse associations points out the actual impact will depend on the Curriculum uptake by regulatory bodies.

As a last remark, there is one more "technical issue" regarding the compliance of the EU Curriculum with the EQF level. Although the Curriculum was originally designed as an EQF Level 7, the need to make it flexible and allow also localization for Greece (where the pilot course is being delivered as an EQF Level 6) most probably caused some ambiguities in the way Learning Outcomes are stated. This is a common complaint among External Experts. This has led the project to the decision to rephrase the Curriculum at two different levels (EQF Level 6 and EQF Level 7), so as to accommodate localization needs at both levels and remove ambiguities from the current version.

"The European curriculum details further all the Learning Outcomes & Units of learning under each of the 28 competencies." (ass. repr. #3)

"They [PP and EU Curriculum] use a different "granularity" but I think the curriculum covers all "aspects"." (ass. repr. #4)

"The profile has been broken down and verified towards the Curriculum." (ass. repr. #5)

"[The EU Curriculum is] Not sufficiently focused on family and patients, it is too much focus on health promotion and is community oriented (homecare is an optional Learning Outcome)." (VET provider #2)

"Caring for families with complex needs at home (such as personalized care plans and meeting special and individual needs in complex care situations) is missing/should be included." (Ext. Expert #3)

"Not innovative enough (for example in terms of ICT skills)." (VET provider #2)

"Gerontological perspective is missing." (teacher #42)

"Greek curriculum partially differs from the others (EQF LEVEL 6). So, it can easily be adopted." (teacher #42)

"Through online training students and teachers will become able to create a community of practice." (teacher #25)

"There is a lot of focus on group work and work-based learning." (VET provider #4)

"I hope it is able to support RPL [recognition pf prior learning], despite the fact that this is something new for Greek teachers, it is the "innovation" I would say!" (teacher #42)

"The definition and adoption of the European curriculum for family and community nurse will lead to standardisation and uniformity of procedures at European level in the handling of chronic patients." (teacher #13)

"Actual knowledge and competencies of FCN will be valorised and enhanced." (teacher #25)

"Besides the fact that even the existence of such a curriculum, that has an impact, the implementation in the current Nursing education (in a hopefully excellent way) will enable the establishment of the targeted aims/topics of the curriculum." (ass. repr. #2)

"[The impact] Depends on the national context & uptake by regulatory bodies given that nursing is a regulated profession. The European curriculum may serve as a helpful stimulus in this respect, further motivated by the national pilots." (ass. repr. #3)

"The level of the curriculum does currently reflect the entrance level EQF LEVEL 6/registered practitioner." (Ext. Expert #1)

"No clear determination of the progression from previous learning - EQF LEVEL 6 to EQF LEVEL 7." (Ext. Expert #2)

"The Learning Outcomes do not match the EQF LEVEL 7 descriptions; they are too low (FCN needs to demonstrate that they know how to manage complex and unpredictable situations)." (Ext. Expert #2)

10.4 Discussion

In this contribution, after introducing the notion of Family and Community Nurse, we have described the development process undertook within our project that led to the definition of a European Curriculum for this professional profile. This is—to the best of our knowledge—the first attempt to define such a shared European Curriculum, aimed to accommodate the various needs in the different countries, thus being potentially taken by the various labour and health systems up.

The process—as it has been described in this contribution—started with the analysis of the existing curricula and educational provisions in the field (or similar fields), as well as the analysis of the scientific literature. Moreover, the process has been participatory in nature, as it encompassed a Delphi Study involving several experts representing different European countries. Moreover, the Curriculum has been developed keeping in mind the main existing European standards (ECVET, EQF, EQAVET, etc.), to which it is now complaint. This guarantees high quality standards and should foster transferability and sustainability of the Curriculum.

Having involved various stakeholders in the evaluation process certainly allowed us to capture different perspectives, ranging from VET designers to nurse associations, experts, teachers, etc. Unfortunately, the fact that students are still piloting the national curricula (due to the stop to the pilots caused by the COVID-19 outbreak) prevented us to collect their results in terms of learning achievements, an information that would have provided an additional input to the evaluation of the Curriculum development.

At the same time, it is already possible to say that the results obtained so far are very positive, both as far as the Curriculum is concerned, and also regarding the outputs of the previous stages of the development process, i.e., the Professional Profile, the National curricula and the Designer's kit.

The need for flexibility has been one of the most challenging aspect of the development process and—according to evaluation data—flexibility is probably its main strong point and weakness: it is considered a strong point by our stakeholders, as it allows localization in different contexts, but at the same time it caused some level of ambiguity in the way the Learning Outcomes are stated.

Flexibility in our Curriculum is implemented through modularity that allows to offer the Curriculum in various forms, ranging from shorter courses (31 ECTS) to longer ones (60 ECTS). Moreover, to be noted that in Finland—due to the way the educational system is organized and thanks to the self-consistency of modules—the project also offered to students coming from other programmes, the opportunity to attend single modules, without attending the whole course. This was an additional test that the project was able to carry out that gave very promising results and would deserve further attention in the future, because it could lead to less extensive curricula.

The potential impact of the Curriculum has been evaluated very positively, and this is another promising result, but of course the actual impact will derive from the interest the Curriculum will be able to raise at policy level. The project—in its last months of implementation—will orient all the effort to dissemination and sustainability, with the aim to maximize its uptake not only in the three countries involved in the piloting, but—even more importantly—in other European countries.

One additional reflection needs to be done regarding the innovativeness of the Curriculum; in our experience, innovativeness in the courses we are piloting does not depend uniquely on the curriculum itself, but does "pass through" teachers, this is because—even if the curriculum contains elements of innovation—then it is up to teachers to implement these innovations in the courses (for example, in terms of teaching/learning methods, technological tools, etc.). In our project this implied having the teachers trained prior to the piloting phase, even if the description of the teacher training falls outside the scope of this contribution (as this was not—strictly speaking—one of the stage of the Curriculum development process), we would like to point out we consider this passage crucial to guarantee innovation in the educational provision. We recommend taking this element into due consideration in other similar experiences.

Moreover, in terms of lessons learnt from our experience that could be useful for future experiences, we would like to stress the importance of the institutional support when you want to implement an innovative curriculum. Despite our VET providers had committed themselves in the project, we found out on some occasions everything was put on the teachers' shoulders who were required to take important decisions regarding their own teaching subjects, especially in terms of technologies to be used, teaching/learning methods to be implemented, assessment and evaluation approaches, etc. Instead, we would recommend to devote the due attention to these aspects and possibly to define shared policies at VET provider level. This will facilitate teachers in taking the innovative curriculum up and allow them to implement it with the most adequate technological and methodological solutions.

Some last considerations deriving from the reported experience have to do with the development process itself. The process was considered sound by the stakeholders involved in our evaluation and—although complex and long in nature—it showed several strong points. On the one side, starting the work from the analysis of what already exists in terms of current educational provision in similar fields, prevents from re-inventing the wheel, and—even more importantly—allows to conceive a Curriculum that has already solid roots and is compliant with the existing

local contexts. At the same time, involving a panel of international experts in the definition of the core competencies provided a sound methodological background for the Curriculum. Moreover, we faced the challenge of developing a European Curriculum, i.e., a Curriculum that is used as a framework to develop other national curricula. In this sense, the choice to equip the Curriculum with a Designer's kit, aimed to support the localization into national curricula, proved to be quite effective and should be considered for future, similar experiences.

To conclude, we would like to point out the process was carried out in the context of a funded project; this was an essential ingredient of the process, as the project provided economical and human resources to a very long and intensive development process, that would have been hardly sustainable in different circumstances.

10.5 Conclusions

In this contribution we have described the development process that led to the definition of the EU Curriculum for Family and Community Nurses. The experience reported shows developing curricula in the field of nursing education can be challenging for several reasons, including the fact that the educational provision in Europe in this context is still quite fragmented and diversified. Differences in the health and educational systems, as well as in the labour markets, are something you need to cope with, if you want to develop curricula leading to European qualifications.

At the same time, the experience demonstrates it is possible to take the most of what already exists, especially if this is integrated with the inputs by experts that can bring their professional and geographical perspectives. This way it becomes possible to build European curricula that can be localized in the various countries, according to national needs and constraints.

Acknowledgments This study has been conducted within the ENhANCE Project, co-funded by the Erasmus+ Programme (Agreement number: 2020-1-IT02-KA201-080089). The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

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Embedding Sustainability in the Nursing Curriculum

11

Norma May Huss, Maud Huynen, Carmen Álvarez-Nieto, Janet Richardson, and Isabel M. López-Medina

11.1 Sustainability, Climate Change and Health Care

The health care sector is an important contributor to the global environmental changes [1, 2] that are affecting the earth's essential support systems and, consequently, human health [3]. Due to its large carbon dioxide (CO_2) emissions, immense water and food consumption, the use of toxic materials and the production of vast amounts of waste, healthcare is ultimately compromising public health and damaging the ability of future generations to meet their own (health) needs [2, 4]. Evidently, the paradox of providing health care whilst simultaneously harming health must be confronted and eliminated [4].

Influential academic reports [3, 5] highlighted climate change as one of the major health threats of the twenty-first century. The World Health Organization (WHO) reaffirmed this concern in a report launched at the United Nations Climate Change Conference in Poland [6] and stated that 'the continuing delay in addressing the scale of the challenge increases the risks to human lives and health'.

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I. Darmann-Finck, K. Reiber (eds.), *Development, Implementation and Evaluation of Curricula in Nursing and Midwifery Education*,
https://doi.org/10.1007/978-3-030-78181-1_11

Human health will be affected by direct impacts such as heat stress and flooding, indirect impacts mediated through natural systems such as infectious diseases and air quality (including aeroallergens such as pollen) and impacts heavily mediated by human systems such as food security [7]. At the same time, however, the provision of health care uses vast amounts of energy in the form of heating, electricity and energy-intensive goods and services [8, 9]. In Germany, for example, about 6000 kWh of electricity and 29,000 kWh of heat are consumed per bed per year, more than the consumption of a single-family house [10]. The health care sector accounts for at least 5% of the CO_2 emissions in the EU, and nearly 10% of CO_2 emissions in the USA [8, 11, 12], with an overall 4.4% of global greenhouse gas emissions (GHGs) being attributable to healthcare provision [9]. Hence, the future prospect of climate change demands a significant reduction in our health systems' carbon footprint as well as sound preparation for its potential health impacts [13, 14].

Additionally, due to hygiene regulations and financial savings, large quantities of single use only materials are used in health care provision, producing vast amounts of waste, and are an increasing concern in relation to adverse environmental impacts and environmental health risks [15–18]. For example, up to 36% of the waste generated during an operation is plastic [19] and the WHO estimates that metropolitan general hospitals in the USA generate as much as 10.7 kg/occupied bed/day [15]. Additional emissions are produced during the production and transport of disposable products [9]. Therefore, a more sustainable health care system needs to tackle this mounting problem via proper waste management as well as source-reduction strategies [15, 18].

Due to the health systems' growing environmental impact and the evident environment-health linkages, there has been an emerging interest in improving sustainability. For example, the Ostrava Declaration [20] resulting from the Sixth Ministerial Conference on Environment and Health (representing the ministers and representatives of Member States in the European Region of the World Health Organization responsible for health and the environment) explicitly calls for building the environmental sustainability of health systems and reducing their environmental impacts. The 'WHO Global strategy on health, environment and climate change 2019–2023' also acknowledges the obligations of the health sector in shaping a healthy and sustainable future and calls for the health sector to lead by example in demonstrating good practice in sustainability (by reducing the environmental impact of health care practice) and to act as leaders and advocates for health and sustainable development [21].

Hence, the health care sector urgently needs to become more environmentally responsible and sustainable. Building on the Brundtland report (World Commission on Environment and Development 1987) [22], sustainable health care can be defined as 'designing and delivering health care that meets today's health and health care needs of individuals and populations without compromising the ability of future generations to meet their own health and health care needs; this requires the provision of health care that recognises and respects the dependence of our health on the earth's ecosystems, without resulting in unfair or disproportional impacts within

society' [23, 24]. The involvement of well-informed nurses is crucial in facilitating the transition towards a more sustainable health care provision [25].

11.1.1 Sustainability, Climate Change and Nursing

As explained by Huffling and Schenk [4]: 'health care and nursing practice, with resource- and energy-intensive processes, contribute to environmental harm through pollution and resources depletion. These negative impacts contribute to illness and poor health: when ill, people seek health care for treatment, which then further contributes to environmental harm, and so on'. So whilst nursing focuses on health and healing, nurses are inadvertently causing harm. As we have an obligation not to harm or increase the risk of harm to others, this raises the question whether climate mitigation is our moral obligation based on the first-do-no-harm principle. The nursing profession is underpinned by maintaining health and has currency promoting the health of individuals and wider society [26]. Viewed in the context of climate change, this is particularly relevant as we increasingly witness the limits of the Earth's resources and the significant adverse impacts the delivery of healthcare has on the environment [9, 27]. Arguably, therefore, the nursing profession has a duty to contribute to climate change adaptation (reducing vulnerability to the harmful effects) and mitigation (reducing or preventing greenhouse gas (GHG) emissions). In this context it is well-placed to take a leadership role in addressing climate change [28]. The International Council of Nursing (ICN) position statement on 'Nurses, climate change and health' calls for 'nurses to take immediate action to build climate resilient health systems' [29].

Nurses have a diversity of roles in the promotion of sustainability and addressing climate change. Nurses have, for example, control over the use, re-use and potential recycling of items used in the delivery of healthcare, particularly in the context of scarce natural resources. Research has indicated gaps in nursing knowledge regarding some of the raw materials that make up many of the items used in everyday healthcare [30]. The potential to reduce, reuse and recycle clinical items may seem to conflict with infection prevention procedures, indicating a requirement for knowledge of these issues in order for nurses to make sensible and safe decisions and support the sustainability agenda [31]. The clinical and general public response to COVID-19 has led to a number of significant resource challenges. For example in the UK it has been difficult to access personal protective equipment (PPE) for clinical staff due to supply issues. Additionally, the disposal of PPE will negatively impact the environment [32, 33]. Furthermore, there are ethical issues regarding the manufacturing of masks in conditions that are harmful to workers. Being environmentally responsible can improve the health of those far removed from our immediate environment [34]. Conversely, the potential to reuse vast amounts of equipment due to infection prevention procedures at this time seriously impacts on the sustainability agenda within healthcare facilities.

Nurses are frontline professionals and are in a key position to respond quickly to constantly changing health and social care needs at a population level across a range

of settings. The changes in climate will lead to different patterns of disease that will require clinical interventions as well as health promotion. For example, adverse weather conditions that lead to local flooding may require emergency interventions to cope with initial injury; long-term care may be needed for vulnerable patients living in damp conditions, or who have mental health issues as a consequence of the flooding event or loss of income. Added to this, emerging infectious diseases and an increased risk of non-communicable diseases will affect the health of all age groups, posing major challenges to healthcare systems [35, 36].

Additionally, the WHO [21] states that health professionals need to promote behavioural change towards more sustainable and healthier ways of living. Nurses can play a key role in health promotion by emphasising the co-benefits of living in a way that reduces human impact on the climate. Significantly, changes in diet and moving to more plant-based consumption will impact on the incidence of heart and respiratory diseases and spending more time outdoors in nature will foster an appreciation for the natural world whilst promoting physical and mental well-being [37].

Hence, with proper sustainability-related education and training, nurses can be encouraged to practise to the full extent of their skills, to expand their health promotion role to address current and emerging ecological public health threats and to take significant leadership roles in sustainable health policy, planning and provision.

11.2 Importance of Integrating Sustainability into the Nursing Curriculum

In view of increasing calls for more sustainable health systems, nurses need to be supported to acquire and develop the key sustainability-related competencies needed for the transition toward more sustainable health systems. Nurse experts in this field increasingly stress the importance of integrating sustainability into nurse education [14, 17, 28, 38–40]. In order to be responsive as nurse leaders, the ICN recognises the importance of embedding 'the concept of sustainability in nursing practice as well as climate change-related knowledge into nursing curricula and in post-registration continuing education' [29].

Nurses will require the knowledge, skills, competencies and confidence if they are to be proactive and meet this challenge. Barriers include a reactive working culture, where the focus is to manage disease rather than prevent illness and promote health [25]. These will need to be overcome so that nurses have the confidence to challenge unsustainable practice. Interestingly, Power [41] suggests that whilst already qualified nurses may be absorbed within existing working cultures, it is the student nurses who might be better placed to act as change agents and challenge existing practice to bring about improvements. Aronsson et al. [42] demonstrate how nurses who have been exposed to sustainability education can take positive actions on sustainability when they are in practice. Therefore, integrating sustainability into nursing curricula is a key action necessary to raise awareness.

Evidence exists of the importance of embedding sustainability, climate change and health into curricula, with emphasis on the how and where, and which topics should be included [17, 40, 43–46]. However, integration and its success often rely

solely on the educator. The reasons for this are manifold: educators are poorly equipped and lack the necessary knowledge [40, 45]; teaching climate change and resource scarcity may appear to have little or no relevance to healthcare [17, 40]; difficulties finding space to integrate topics into already crowded curricula, and the lack of existing assessment approaches [45].

Previous studies [47] assessed attitudes before and after the delivery of one specific sustainability scenario-based learning session when delivered to second year nursing and midwifery students. This study found that attitudes and knowledge improved immediately following participation in the session, demonstrating immediate learning. What is important about this research was the way in which educational intervention was integral to a clinical skills session [17, 48]. Rather than seeing climate change and sustainability as something separate from nursing, topics were fully integrated into subjects such as leadership, public health and clinical care pathways. Finding out what students need to know will help identify trends and themes within the curriculum [45, 49, 50]. These themes can be divided into topics to be taught and mapped against professional body competencies and/or legal expectations and frameworks thus giving them professional relevance [51]. Early introduction and integration of these themes into the curriculum help emphasise the relevance and importance of the subjects and their relationship with professional identity [40, 44, 52]. By involving students, listening to their concerns, encouraging self-awareness and motivation, students can be encouraged to take ownership which can result in learner empowerment and learner-driven change.

11.3 Key Sustainability Competencies for Nurses: An Expert Assessment

The Erasmus-funded European NurSusTOOLKIT project was developed to provide free, online, evidence-based Sustainability Literacy and Competency (SLC) resources in nursing education. The purpose was to develop innovative teaching and learning approaches and materials based on sustainability values and concepts, evidence, expertise and professional relevance.

As part of the NurSus-project, the perspectives on integrating sustainability-related education into nursing curricula among 52 European nurse educators and senior professionals, using a two-rounds online Delphi-survey, were explored [51]. The Delphi approach is a method for soliciting expert opinion, based on an iterative process of survey, feedback, and re-survey (i.e. the second survey round is based on the results of the previous one) [53–58]. The participants represented a diverse group of nurse educators and senior nursing experts, with their selection based on appropriate professional networks (e.g. European Federation of Nurse Associations EFN, European Network of Nursing in Higher Education ENNE), the researchers' networks and relevant academic publications. The participants included, among others, six presidents of National Nurse Associations and six other national representatives in the European Federation of Nurse Associations (e.g. deputy delegates). The panel consisted of experts from Northern, Southern, Western and Eastern European countries.

The Delphi-survey results clearly illustrated that the participating experts think that it is important to integrate sustainability-related knowledge and skills into nursing curricula; the majority of participating experts think that it is (very) important to integrate sustainability in nursing programmes (Fig. 11.1).

It is interesting to note that the perceived importance of integrating sustainability into nurse education was also confirmed in surveys among European student nurses [40, 48]. The participating experts considered it important to integrate sustainability in nurse education in order to educate future-fit nurses; to increase environmental awareness and decrease environmental impact; to promote healthy sustainable communities; to respond to Corporate Social Responsibility, professional and/or educational guidelines and to recognise our moral responsibility. Furthermore, most participants (88%) indicated that sustainability should be an integral part of relevant modules throughout the curriculum, with or without a brief introduction module. This means that sustainability-related education should be ideally integrated into existing parts of the nursing programme [59].

The Delphi-survey also included the experts' evaluation of the most important sustainability-related competencies for nurses. Regarding the cognitive and functional competencies, the survey outcomes illustrated that the ability to show ownership, responsibility and ability to justify professional decisions (in view of sustainability) was seen as very important. Other top scoring competencies related to the enhancement of sustainable health care (all levels) by applying sustainability knowledge and skills as well as by applying organisational awareness, problem solving strategies and management skills. Furthermore, participants indicated that nurses should be able to

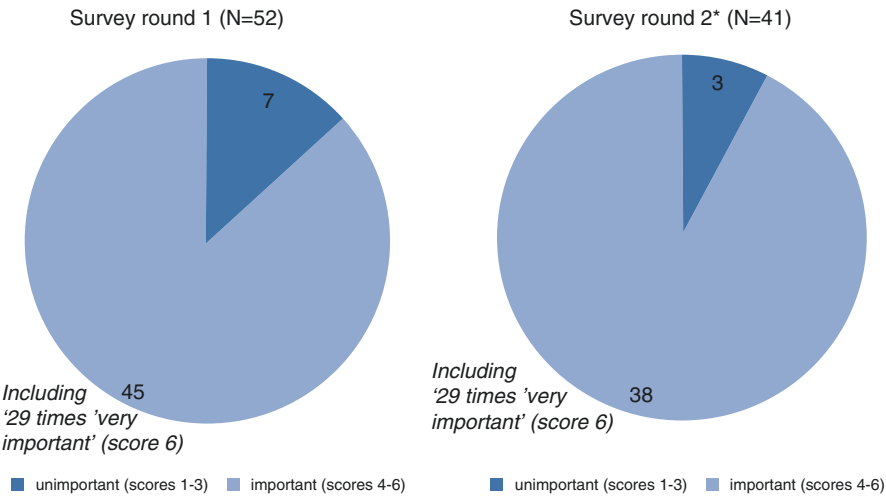

Fig. 11.1 Survey rounds 1 and 2. How important do you believe it is to integrate sustainability-related education into the nursing curriculum (on a scale from 1 to 6, where 1 means 'very unimportant' and 6 means 'very important')?

identify possible synergies between health promotion and environmental sustainability and to demonstrate resilience in their sustainability-related assessment and planning of care. With regard to important personal and ethical sustainability competencies, the survey participants indicated that nurses need to be able to show responsibility and willingness to change. Additionally, the experts felt that nurses need to be motivated to contribute to a sustainable nurse profession and to demonstrate self-sufficiency and resilience in their own professional development. Other personal competencies that were considered important included reducing your own environmental impact (in particular relating to waste segregation and energy use) and encouraging a positive attitude towards sustainable behaviour in others.

Building on the survey outcomes [51], Box 11.1 shows the key sustainability competencies for nurses. This overview shows that nurse students need to become motivated to contribute to sustainable nursing and to reduce environmental impact. They need to become capable of justifying sustainable decision-making and demonstrate the ability to use their knowledge, skills, organisation awareness, problem solving capacities and management skills to contribute to the sustainability changes needed. For this, they need to be equipped with key sustainability knowledge and skills. Nurses need to be trained to integrate sustainability into daily nursing practice, communicate about sustainability (and how it relates to health, health care, nursing and the health-promoting duties of health practitioners) and manage and organise sustainable practices. Furthermore, applied knowledge should be embedded in sound theoretical understanding of why certain sustainability-related practices are important to implement [51]. The NurSusTOOLKIT project, accordingly, developed education materials for integrating sustainability in nursing curricula.

Box 11.1 Key Sustainability Competencies for Nurses

Ability to show ownership, responsibility and ability to justify professional decisions (in view of sustainability)
Ability to use the knowledge and skills needed to contribute to improving the sustainability of health systems at different levels (e.g. individual practice, health service management, the design of care systems)
To encourage a positive attitude towards sustainable behaviour in others (e.g. sustainable transport, waste management, energy use, diet)
To show responsibility and willingness to change (in view of sustainability)
To be motivated to contribute to the sustainability of the nursing/midwifery profession
Ability to use the organisational awareness, problem solving strategies and management skills needed to contribute to improving the sustainability of health systems at different levels (e.g. individual practice, health service management, the design of care systems)
Ability to identify potential synergies between policies and practices that promote environmental sustainability and those that promote health
Ability to demonstrate resilience in assessing and planning the organisation of care (in view of sustainability)
To be motivated to adopt appropriate segregation of waste
To be self-sufficient and resilient in own professional development

11.4 Structure and Design of Digital Educational Materials

The NurSusTOOLKIT is a sustainability learning/teaching programme providing an evidence-based resource repository for nurse educators. It contains a variety of teaching and learning strategies, is adapted for context specific relevance and is linked to national nursing standards and competencies for several countries (UK, Germany, Netherlands and Spain).

11.4.1 The Sustainability Literacy and Competency (SLC)-Framework

The Sustainability Literacy and Competency (SLC)-Framework is based on Tempel and Ilmarinen [60] 'house of workability' model (Fig. 11.2). As such, the dimensions of the SLC-Framework are depicted in the form of a house with its surrounding environment.

The first floor comprises sustainability values and concepts, and an evidence base, providing the SLC-Framework with a strong foundation.

Various declarations on concepts and values in higher education and sustainable development underpin the SLC-Framework including The Lüneburg Declaration on Higher Education for Sustainable Development [61] and The Future Fit Framework published by the UK Higher Education Academy [62]. The evidence-base resulted from:

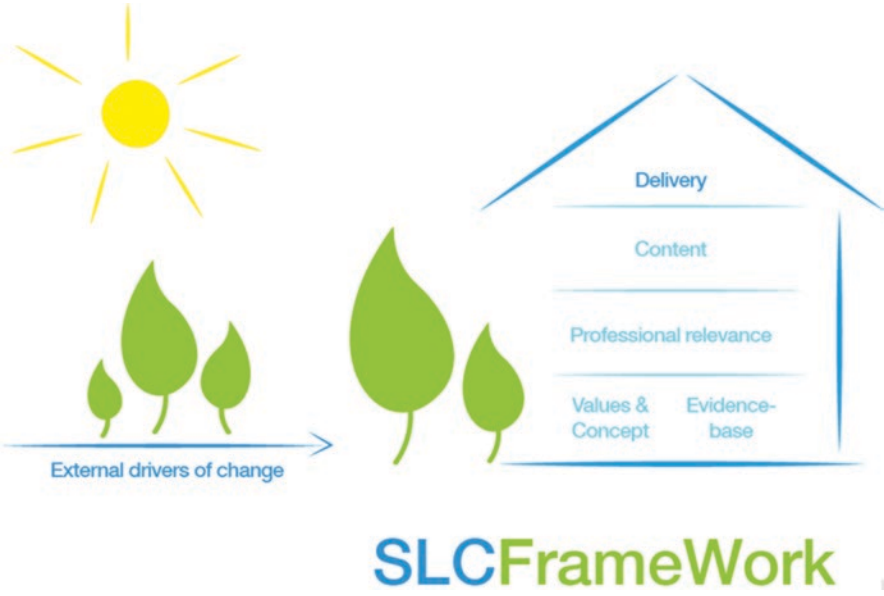

Fig. 11.2 SLC-framework. (Permission from the NurSus Team)

- literature reviews: (1) What nurses need to know about sustainability and (2) What pedagogic approaches are used to embed sustainability in curricula in nursing or higher education?
- curriculum scoping: to identify areas where sustainability is embedded and possibility of integrating sustainability topics
- the results of the Delphi study
- student engagement including the results of The Sustainability Attitudes in Nursing Survey (SANS_2) [48].

These activities resulted in a prioritised list of topics for sustainability and nursing.

The second floor comprises professional relevance for the four countries UK, Germany, Netherlands and Spain.

The third floor is strongly supported by the first and second floor. It contains the content, 60 topics in five themes (e-modules) which were developed and tested through pilot and prototype development [51]:

1. Underpinning concepts: Sustainability and health
2. Providing environmentally sustainable health care
3. Relationships between health and the environment
4. Healthy (sustainable) communities and
5. Social and policy context.

The fourth and top floor is the repository for the resources. Although the materials for each topic were developed by teams in different countries and were adapted to encompass the characteristics, context and more prevalent health problems of each country, they all have the same structure. For each topic, there is a Description of Materials, Teachers' Guide, Lecture Slides, Lecture Notes, Interactive Activities, and References and Resources. The 'description of materials' provides a clear indication of how the module can be integrated into the nursing curriculum. Pre-requisite knowledge is defined and there are links to national standards and competencies. The Interactive Activities range from quizzes to scenario-based sessions. These can be used as an introduction to a topic or as a form of summative and/or formative assessment. Priority settings used in the Delphi Study lead to the development of core (common) modules based on prior knowledge, skills and competencies.

The surrounding environment of the house represents the external drivers of change. These include professional and academic developments that support and influence the SLC-framework over time and risks or barriers to integrating and teaching SLC content in the nursing curriculum.

The main target groups for Sustainability Literacy and Competency (SLC) framework and the teaching materials supported by significant resources incorporated in the NurSusTOOLKIT are nurse teachers/educators in universities and schools of nursing. As the resources and materials have been sourced in Creative Commons, they are free and can be reused or individually adapted, shortened or supplemented as required.

The NurSusTOOLKIT provides vocationally relevant Sustainability Literacy and Competency resources and teaching materials to enable nurses to work in a labour market that needs to adjust to and prepare for a changing climate.

11.5 Quality Assessment of the NurSusTOOLKIT Educational Materials

Developing and testing the teaching and learning materials were carried out by education experts, technical experts in evaluating digital learning and teaching materials in higher education and practitioners and students in the UK, Spain and Germany, and were revised based on feedback.

A modified and authorised questionnaire from the Spanish Standard for the assessment of Digital Educational Material Quality (COdA) was used [63]. The COdA tool enables the evaluation of the quality of Digital Educational Material (DEM) at University level with three dimensions: Didactical, Technological and Accessibility. It is a validated tool to assess and guide the creation of educational and technologically effective digital teaching material; the COdA tool was evaluated for validity and reliability [64].

The original COdA questionnaire consists of 11 criteria: coherence/understandability, content quality, ability to generate learning, adaptability, interactivity, motivation, format and design, reusability, portability, interface accessibility and content accessibility. Each criterion is broken down into sub-criteria, which are scored from 0 (when the sub-criterion was not reached) to 10 (if it was fully reached). The ratio per criterion and the global ratio were calculated using the scores from the COdA questionnaire. Based on the global ratio, a quality categorisation of the materials is defined, including ratings of excellent (ratio ≥ 9), very good ($9 >$ ratio ≥ 8), good ($8 >$ ratio ≥ 6), not good enough ($6 >$ ratio ≥ 4) and poor ($4 >$ ratio ≥ 0). The minimum quality for a DEM is set to a value higher or equal to 6.

For a pre-use evaluation of the DEM, two modalities of the COdA tool for two user profiles were designed, targeting students and professionals (teachers, clinical professionals and expert advisors). Fifteen experts rated the content validity to assess the desired construct of the two modalities of the COdA tool. Using a questionnaire Likert scale (from 1 to 5) they assessed utility, clarity, completeness, precision and usability for each criterion. The technical experts in digital educational materials evaluated these using the complete original version of the COdA tool [23].

In addition to the COdA questionnaire, socio-demographic data were collected from the participants, and two open-ended questions were included inviting comments about the experience of using the materials and suggestions for improvement. A content analysis was conducted for this qualitative data.

Native speakers translated the questionnaires into English and German. These translations were translated back to Spanish by other native speakers and modifications were made where necessary.

According to independent experts (COdA authors), the final versions of COdA represented adequate translations of the Spanish original. Finally, to assess the content validity of the English and German versions, the same process described above for the Spanish versions was carried out.

The evaluation of the NurSusTOOLKIT educational materials provided valuable information on its relevance, usability and acceptability and resulted in the strategy for the development of new content. All content adopted a standard format based on this assessment.

The NurSusTOOLKIT educational materials were evaluated by 299 nursing students (161 students from Jaén University; 106 from Plymouth University and 32 from Esslingen University) and by 22 professional evaluators with different profiles: (teachers, clinical professionals and expert advisors). The students and professionals evaluated the materials as good or very good, scoring them with 7.98 ± 1.28 and 8.50 ± 1.17 points, respectively. The ability to generate learning was scored higher among students (mean difference between students and professionals: 0.84;0.22–1.47; $p = 0.008$). It is concluded that students, professionals and technical experts considered the materials to be of very good quality, especially with regard to the quality of content, format and design. For students, these materials can generate reflection and learning about environmental and health issues during nursing training [23].

11.6 Effectiveness of NurSusTOOLKIT Educational Materials

It was also important to determine the real effectiveness of the NurSusTOOLKIT educational materials to achieve the acquisition of health and environmental competences in students, beyond the quality perception.

In a quasi-experimental study, an evaluation of a pre-post educational intervention demonstrates the effectiveness of educational materials for training nursing students in environmental health competencies. The e-NurSus Children intervention was carried out by applying the children's environmental health content of the NurSusTOOLKIT to 267 nursing students in Spain and 157 students in the UK. The effectiveness of the educational intervention on the attitudes, knowledge and skills of the students was determined by measuring these competencies before and after the e-NurSus Children intervention. The attitudes, knowledge and skills of the nursing students improved after the e-NurSus Children intervention, with a greater increase in environmental health knowledge (39.02%), followed by skills (29.98%) and finally attitudes (15.81%). The e-NurSus Children intervention is useful for improving the attitudes, knowledge and skills of nursing students with respect to children's environmental health [65].

11.7 Examples of Topics and How They Are Integrated into the Nursing Curriculum in a Number of Educational Institutions

11.7.1 UK

Richardson et al. [17, 47, 48, 66] demonstrate how embedding sustainability and climate change in nursing curriculum can positively change nurses' attitudes and increase knowledge. The educational interventions they use are drawn from the NurSusTOOLKIT (nursus.eu) (see examples Box 11.2).

Box 11.2 Summary of NurSusTOOLKIT Educational Interventions Integrated into Undergraduate Nursing Curriculum in the UK

Educational intervention year 1	Educational intervention year 2	Educational intervention year 3
The session focuses on a case study scenario of a family when health and care is compromised due to climate change and compromised resource issues. Although fictitious, the case study is based on actual research on climate change and health; it includes real events that resulted in supply change challenges and the issuing of a medical device alert. The materials include a lecture with relevant short video clips, group activities, and additional references and resources (full details can be found at https://open.plymouth.ac.uk/login/index.php see Topic *P1_B1 Introduction: The relevance of sustainability and climate change to nursing and healthcare*)	In the session, students are challenged to make connections between items they use in clinical practice that are made from natural resources (such as oil and cotton), and potential challenges to clinical care if the natural resource was no longer available (see this short film by way of example http://youtu.be/zIFT2Dbg08o). Full details of how to run this session, together with associated research can be found at https://open.plymouth.ac.uk/login/index.php *P2_B1 Sustaining the global environment: strategies to minimise clinical waste in healthcare*, download the Health Environment and Resources Toolkit File	Students are presented with a clinical scenario of a patient manifesting symptoms that related to an outbreak of Escherichia coli (E.coli). A short lecture is followed by group discussion that links the potential for an increase in the spread of waterborne disease with climate change. Students are required to design a programme to manage the outbreak, including dealing with potential attention from the media. They are also invited to discuss how they could develop a wider public health awareness campaign. Following this they consider how climate change and damage to the environment (e.g. flooding, soil degradation) might impact on health (see https://open.plymouth.ac.uk/login/index.php *P3_B1 E-Coli outbreak and links to climate change*)

The core sustainability competencies developed by the NurSusTOOLKIT Project have been presented to the UK Nursing and Midwifery Council as possible basic standards for Registered Nurses as part of the consultation for new nursing standards. The NurSus team is working in collaboration with a new network in the UK (http://networks.sustainablehealthcare.org.uk/network/green-nurse-network) to promote sustainability in nursing. The NurSus team is also working with the Royal College of Nursing in the UK to develop NurSusTOOLKIT materials for the continuing professional development of qualified nurses.

11.7.2 Spain

Students participated in a taught session entitled e-NurSus Children with the purpose of improving their competencies on environmental risks and children's health issues. Students were introduced to a case study involving an asthmatic child. They

worked in groups of four to five people discussing issues arising from the assessment of the environmental risks to which the child was exposed in his home, school and environment. After analysing the case and interpreting the data provided, the students provided solutions and proposed nursing interventions to address the case raised. There were a maximum of 20 students in each session. The duration of each session was 90 min. All the materials used in the sessions are available in Spanish and English, in module *J3_A1 Children's health and the environment* on the NurSusTOOLKIT platform. The materials include the case study scenario and a game to encourage learning in a fun way (full details can be found at https://open.plymouth.ac.uk/login/index.php).

The materials have also been presented to secondary and baccalaureate students to raise awareness of the importance of the relationship between sustainability, climate change and health. This activity in which the students attend the University of Jaén is called Coffee with Science (https://www.ujaen.es/servicios/ucc/eventos/cafe-con-ciencia-2019). Students played in groups using the different resources from the NurSusTOOLKIT such as games from topics *J3_A1 Children's health and the environment* and *E3_B2 Our Climate our Health* (full details can be found at https://open.plymouth.ac.uk/login/index.php).

At the Catholic University of Murcia, materials from NurSusTOOLKIT are used in various sections of the curriculum of Community Nursing, year one. These materials have been integrated into Theme II: Environmental sustainability and Nursing, Topic 8: Ecology, sustainability and health (https://laurea.ucam.edu/doa/consultaPublica/look[conpub]MostrarPubGuiaDocAs?entradaPublica=true&idiomaPais=es.ES&_anoAcademico=2020&_codAsignatura=11353).

The tool COdA (Quality of Learning Objects) has been included in the Spanish standard UNE 71362: 2017 Quality of digital educational materials. The application profiles of this tool (students' profile, professionals' profile and technical profile), designed by NurSus team, have been included in the standard UNE 71362 as a mode of using this standard to evaluate digital educational materials, see: http://www.aenor.es/aenor/normas/normas/fichanorma.asp?tipo=N&codigo=N0058497&PDF=Si - .WWZUccabLwe.

11.7.3 Germany

Although the NurSusTOOLKIT was developed for integration in the nursing curriculum, it has been successfully used in other areas [67, 68]. At the University of Applied Sciences in Esslingen, nurse teacher students took part in a general studies course offered by the university. This course took place over 2 full days, 3 weeks apart. The activity from *P1_B1, The relevance of sustainability and climate change to nursing and healthcare* was used as an introduction to sustainability. The students evaluated this as being fun and very informative. A second session *E2_C1 The preservation of a stable ecological environment—waste reduction and disposal, resource ethics*, available in German and which covers hand hygiene, was completed by the students. As the majority of students work part time in clinical nursing practice they

were asked to observe their own and colleagues' behaviour between sessions. After being in the clinical area, the majority reported a greater awareness regarding the use of gloves by themselves and by their colleagues and a personal reduction in the use of gloves after the session.

Other projects, which have been completed within a curricular module 'Research and Development in Educational and Nursing Practice', include:

- planning an interactive information stand, based on the NurSusTOOLKIT modules *E2_C3 The importance of sustainable nutrition in healthcare provision* and *P2_B1 Sustaining the global environment: strategies to minimise clinical waste in healthcare* for an open day at a local hospital
- researching the history of consumables (plastic aprons, medicine cups and infusion bottles) and their supply chain in order to recommend alternatives based on *P2_A1 Sustaining the global environment—the limited global resources used in nursing care and where they come from*
- using scenario-based teaching [66] and *P1_B1 Introduction: The relevance of sustainability and climate change to nursing and healthcare*, *E3_B2 Climate change and health* and *P2_B1 Sustaining the global environment: strategies to minimise clinical waste in healthcare,* students demonstrated integration of sustainability, climate change and health during an introductory block of student nurse training. Full details can be found at https://open.plymouth.ac.uk/login/index.php

An increasing number of students are completing their bachelor and master dissertations with healthcare related sustainability as the focus.

These examples demonstrate that the NurSusTOOLKIT educational materials show great potential for training nursing students in universities and schools of nursing in health and environmental issues. In the coming years, integrating NurSusTOOLKIT materials in nursing curricula, at an international level, may provide more evidence of its effectiveness.

11.8 Summary

The free online access to the NurSusTOOLKIT provides an interesting tool for use in Higher Education and Lifelong Learning, increasing the employability of health professionals. Nursing teachers are incorporating the NurSusTOOLKIT modules into the nursing curriculum beyond the partner universities that are members of this research team. Based on a recent audit by the NurSus administrators (personal correspondence), the NurSusTOOLKIT is currently being used by over 500 registered participants in 16 countries, including Australia, the USA and Canada. The contents of the NurSusTOOLKIT have generic healthcare applicability and can also be of relevance to educators of other healthcare and non-healthcare providers [67, 68].

Healthcare educators, practitioners and managers will be able to use the NurSusTOOLKIT as a resource, as it provides evidence-based information to

support practice, and promote in-house training in health and sustainability. It is hoped that policy-makers will use the evidence-based content to develop health and sustainability mitigation strategies and for nursing and healthcare professional bodies to adopt these strategies.

The NurSusTOOLKIT is available in a range of languages: English, Dutch, German, Spanish, French, with some limited availability also in Polish, thus broadening its accessibility across Europe. Materials can be freely accessed on the NurSusTOOLKIT online platform (http://nursus.eu/).

Acknowledgements The NurSusTOOLKIT project (www.nursus.eu) was funded by the European Union Erasmus+ scheme project number 2014-1-UK01-KA203-001645.

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Curriculum Development in Interprofessional Education in Health

12

Jill E. Thistlethwaite

12.1 Introduction

Nursing and midwifery programmes globally are increasingly engaging with other health professions to provide interprofessional education (IPE) for their students and postgraduate learners. In this chapter, I focus on interprofessional curriculum development including definitions of terms, the rationale for and educational theories underpinning IPE, interprofessional learning outcomes, activities and assessment. While I am a medical professional by background (a general practitioner), I have been involved with IPE for over 25 years. Note that I employ the term patients for recipients of health care in the following while recognising that this is not how all health and social care professionals refer to their clients, service users or consumers.

12.2 Definitions and Terminology

A curriculum is 'the formal plan of study that provides the philosophical underpinnings, goals and guidelines for delivery of a specific educational program' ([1], p. 1). IPE is not a specific program but an educational approach; it should not be seen as a standalone course, but rather as an integral part of all health professional curricula, i.e. it should not be siloed. The most frequently used definition globally for IPE is: 'occasions when two or more professions learn from, with and about each other to improve collaboration and the quality of care' [2]. The prepositions 'from, with and about' are important as they stress that interprofessional learning (IPL) is interactive and equitable. The definition also emphasises that the purpose of

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I. Darmann-Finck, K. Reiber (eds.), *Development, Implementation and Evaluation of Curricula in Nursing and Midwifery Education*,
https://doi.org/10.1007/978-3-030-78181-1_12

IPE ultimately is to enhance patient outcomes through care delivery. Of course, it is not feasible that two or more health professions can be present for all learning activities in a nursing or midwifery curriculum, and this is not necessary for nursing-specific (uniprofessional) learning outcomes.

Interprofessional as an adjective should not be used solely to describe two or more professionals working in parallel. The word, when applied correctly, implies mutual respect and understanding of roles, responsibilities and values. Interprofessionality, which emphasises cohesive practice as a response to fragmented health care delivery [3], includes the ability to communicate, negotiate, manage conflict, build consensus and compromise when necessary. These professional attributes are necessary for interprofessional collaborative practice, which the World Health Organization defines as when multiple health workers from different professional backgrounds work together with patients, families, carers and communities to deliver the highest quality of care [4]. The term interprofessionalism is also used as an extension of professionalism; similar to developing a professional identity, a curriculum can help with the development of an interprofessional identity [5].

12.3 Advocating for Interprofessional Education

In the last decade there has been a call to change health professional education, including nursing, to encompass evidence-based practice, professionalism and interprofessional communication and collaboration [6] amongst other competencies. Some readers may be considering introducing IPE into their curricula and may need to negotiate with leadership for its inclusion. Champions are required from each department or school that may be involved in the future interprofessional learning. An interprofessional working group is necessary to role model interprofessional principles and advocate for change. This group will need to be prepared to answer the questions frequently asked by sceptics: what is the point of and the evidence for IPE?

In response we need to start with the rationale for interprofessional collaborative practice. In the twenty-first century, a diverse range of health and social professions are involved in the delivery of health and social care including but not limited to nursing and midwifery, medicine, pharmacy, physiotherapy, nutrition and dietetics, occupational therapy, radiography, social work, and psychology as well as occupations such as health care assistants and physician associates. Health and social care professionals may work in well-defined teams or practise in looser collaborations. For many patients, care is unlikely to be provided by a single professional as no one person has the capability to work optimally with every patient, family or community with health and social care needs. This is particularly so because of the rising prevalence of chronic and long-term conditions, such as cardiovascular disease, diabetes, arthritis, dementia and mental health problems. In addition, it is likely that there will be future global pandemics such as that caused by Covid-19, requiring coordinated cross professional, cross-sectoral and cross-national responses. It is important that professionals understand each other's roles,

responsibilities and values, and can work together as and when necessary. Learning together logically enhances working together [7]: learning together is the crux of IPE.

Interprofessional champions agree that IPE can contribute to challenging and renegotiating traditional ways of thinking and working as professional hierarchies, roles and boundaries have the potential to inhibit collaboration [8]. Interprofessional activities have the potential to facilitate health professionals and students to appreciate each other's contributions to patient care; interprofessional learning promotes shared exploration of multifaceted problems and the development of team goals [8].

While now over a decade old, the World Health Organization's (WHO) *Framework for Action on Interprofessional Education and Collaborative Practice* [4] remains a good summary of the foundations of IPE and interprofessional practice. More recently, the WHO's guidelines for health professionals' education recommended that training institutions should implement IPE while recommending that further evaluation is required of its impact [9].

The evidence for the effectiveness of IPE does, however, continue to grow. There are hundreds of peer-reviewed papers on IPE and interprofessional practice in the scholarly literature, and an increasing number of systematic reviews. As with other studies looking at the effects of education at pre-qualification (or pre-licensure) level, it is difficult to demonstrate that any specific elements of the curriculum contribute to professional performance after qualification. Health professional education in general, and IPE in particular, is a complex series of interventions in a dynamic system. There are multiple confounding factors as learners navigate through diverse clinical and community settings with no two students having exactly the same experiences throughout a program. Moreover, the time between learning activities at university, or other training, and delivering unsupervised care as a fully qualified health professional can be from days to several years [10]. It is almost impossible to show causation across such a fluid time span—the most evaluators may hope to demonstrate is correlation between curricular changes and student learning achievements, and perhaps over time correlation of learning with improvement in patient outcomes.

Taking into account these provisos, there are ways to evaluate pre- and post-licensure IPE to explore whether it does help learners achieve the defined curricular learning outcomes (or competencies) that are relevant to and appropriate for interprofessional practice. Methods are continually being refined and moving from a focus on learner satisfaction or other learner defined outcomes to explorations of how knowledge, skills and clinical performance are enhanced through IPE. Reviews that may be used to promote the effectiveness of IPE are those from the Institute of Medicine (USA) [11] and the Cochrane Collaboration [12]. More recently, a review of reviews by Reeves and colleagues concluded that 'IPE can nurture collaborative knowledge, skills, and attitudes'. The authors 'also found more limited, but growing, evidence that IPE can help enhance collaborative practice and improve patient care' [13]. The effectiveness of IPE appears to be affected by the complexity of the learning material, how appropriate the program design is and whether competency standards are defined [14].

12.4 A Model for Interprofessional Curriculum Development

The 4-dimensional (4D) framework [15] provides a useful approach when considering developing an interprofessional curriculum (Table 12.1). While the framework can be applied to uniprofessional health curricula, it was designed by a group of interprofessional scholars with an emphasis on both local and global contexts. Within an institution, curriculum planners need to decide on how the desired interprofessional aspects will fit within the existing uniprofessional curriculum through a process of curriculum refreshment, or whether the existing curriculum needs a complete renewal with uni- and interprofessional elements interwoven as appropriate.

12.4.1 Identifying Future Health Care Practice Needs

For either of these options, dimension one of the 4D framework recommends ensuring that the curriculum will meet the future health care needs of the population the university or training organisation serves as well as considering global health and potential technological developments in health care delivery. Curriculum planning is more complex when the IPE is for learners not only from different schools, but also different universities, and when some professions are not university based.

12.4.2 Defining Interprofessional Learning Competencies or Outcomes

A curriculum needs to define what is expected of learners—what they should achieve by the end of the program. Dimension two of the 4D framework focuses on understanding, defining and reaching consensus on the competencies required for interprofessional practice. The interprofessional aspects should be couched in similar words to the overarching curriculum—this might mean defining learning

Table 12.1 The four-dimensional (4-D) curriculum development framework for IPE (adapted from [15])

Dimension	Description
D1. Identifying future health care practice needs	Connecting practice needs to new and changing workplace demands. Curriculum takes into account global and local health and education reforms
D2. Defining and understanding competencies/ capabilities	Desired interprofessional knowledge, skills and attitudes of all health professionals
D3. Teaching, learning and assessment	Development of appropriate and equitable education and assessment experiences guided by D1 and D2
D4. Supporting institutional delivery	Consideration of local culture, structure and logistics that impact on IPE including resources, student numbers, timetables, entry requirements

objectives, outcomes, competencies, capabilities or, in some cases, entrustable professional activities that are key tasks that a professional may be trusted to carry out in a specific health care context [16]. Underpinning any of these concepts are the knowledge, skills and behaviours required for collaborative patient care.

Health professional curricula are informed by a health profession's specific national accreditation body. For interprofessional competencies it is important to consider each health profession's accreditation requirements. Typically, in many countries, interprofessional competencies are written in different words and with different emphases across the professions, making it difficult to reach consensus on the same set of outcomes for all professions. Some nations, such as Canada and the USA, are in the process of agreeing a specific list of interprofessional competencies for all health professions that will inform accreditation standards and be scrutinised during institutional accreditation visits.

In the formal (written-down) curriculum, it is important that the majority of the interprofessional competencies may only be achieved through interaction amongst health professional students. Generic competencies that are common for most, if not all, health professions such as eliciting the patient (hi)story, developing and communicating a management plan, and record keeping may be learned uniprofessionally but interprofessional learning adds value by comparing and contrasting approaches with the aim of optimal collaboration.

There are useful IPE frameworks [17–19] incorporating interprofessional competencies that may inform development of a program's own curriculum (Table 12.2). There are common overarching themes in these frameworks that have remained fairly constant in the last decade [20]. While teamwork is an obvious example, others include roles and responsibilities of health professionals; interprofessional communication; reflective practice as it relates to collaboration; patient-centred practice and the role of the patient within the team; ethical practice; shared leadership; negotiation and dealing with conflict.

12.4.3 The Curriculum: Teaching, Learning and Assessment

Dimension three of the 4-D-Model is the delivery of IPE: learning and teaching activities, and assessment. Here, it is important to consider curriculum alignment [21] of defined outcomes with available learning activities and experiences and relevant, appropriate and feasible assessment. Some universities have adopted a common curriculum model that involves students from different health and social care professions spending one or more weeks learning together, full or part-time, on a defined topic. There is, however, a danger that some of this learning may be multiprofessional, i.e. students learn side by side, for example. in a lecture theatre, without engaging with each other. For the common curriculum to be shared and interprofessional, activities need to be interactive and not solely didactic. Students need to be aware of the reasoning behind bringing them together.

The WHO has identified four principles that are important in the design of interprofessional curricula: relevance to learners' current or future practice;

Table 12.2 Three interprofessional learning outcomes/competencies/capabilities frameworks

Framework	Themes	Examples
Canadian Interprofessional Health Collaborative [17]	1. interprofessional communication 2. patient/client/family/community-centred care 3. role clarification 4. team functioning 5. collaborative leadership 6. interprofessional conflict resolution	Learners/practitioners understand the principles of teamwork dynamics and group/team processes to enable effective interprofessional teamwork. Learners/practitioners from different professions communicate with each other in a collaborative, responsive and responsible manner
Curtin University, Western Australia. Interprofessional capability framework [18]	Communication Team function Role clarification Conflict resolution Reflection	Describes common situations where conflict may arise in interprofessional teams and strategies that can be employed to address this. Communicates in a manner that promotes positive interactions. Critically evaluates service/care outcomes, policies and procedures
Interprofessional Education Collaborative [19], USA	Interprofessional communication practices Roles and responsibilities for collaborative practice Values/ethics for interprofessional practice Interprofessional teamwork and team-based practice	Apply relationship-building values and the principles of team dynamics to perform effectively in different team roles to plan, deliver and evaluate patient/population-centred care and population health programs and policies that are safe, timely, efficient, effective and equitable

incorporating typical and priority health issues that are solved through interprofessional approaches; IPL based on clinical practice; and interactive learning methods such as small group and case-based learning [9]. One starting point is for all students to have sessions on the nature of the health system and how it functions within their own country, including how patients access care and from whom, costs, referral processes and examples of models of care, both optimal and less well-functioning. Examples of how care has failed, particularly in terms of communication between professionals, also highlight the rationale for bringing students together to learn. The challenge is to make such learning stimulating and relevant, particularly for those less mature students who may not have engaged with the health care system as patients or clients to any extent before.

A frequently asked question is when is the best time for IPE to be introduced? There is no specific evidence on which to base an answer. My preference is a spiral curriculum model that exposes students to interprofessional learning experiences in the classroom in the early part of their program with subsequent clinical and simulation experiences in the later years. One spiral approach is that developed at

the University of British Columbia in Vancouver which has three levels based on the stages of becoming a health professional [22].

In the first stage (*exposure)*, first- and second-year students from multiple professions interact as peers. This encompasses 'learning about' in the definition of IPE. Outcomes may include understanding other professions, while making sense of one's own. Activities may be low-fidelity simulation, case-based learning (including e-learning), group work, discussion and reflection. In the second stage (*immersion),* senior students have clinical and practice-based collaborative learning experiences, as well as longer and more high-fidelity simulation experiences. Facilitators enable them to explore the strengths and boundaries of their own profession and to begin to develop an interprofessional world view. Learning should be more challenging with, for example, community-based team projects, appreciative inquiry, problem-based learning, and patient-facing group activities. The third and final stage (*mastery*) involves final year students and newly qualified health professionals being encouraged to reflect critically about their own professional identities and values and how these relate to those of other professions. Learning may occur in student run (or guided) clinics, training wards and other workplaces.

12.5 Application of Learning Theories for Optimal Interprofessional Education

When developing interprofessional learning activities, educators need to consider the underlying learning theories that should inform their choice. There has been criticism that IPE has largely been atheoretical, not only in relation to curriculum design and evaluation but also to the nature of interprofessional practice itself [23]. However, a large range of learning theories are frequently underpinning curricula implicitly rather than explicitly [24]. While theory is now being more widely considered by the interprofessional community [25], it is important that we explore appropriate theories not only from healthcare and health professions education, but also other from other areas such as business, organisational literature and the scholarship of learning [8].

Adult learning theories, within the overall learning theory of cognitive constructivism [26], recommend that learning experiences should be relevant to learners and relevant to their circumstances [27]. Social constructivism underpins the concept of communities of practice, originally developed through ethnographic methods in call centres [28], but now widely applied to professional practice [29] and IPE. These theories suggest that health professional learners should engage in clinical and team-based tasks that stimulate clinical reasoning [30] and problem-solving, and be as authentic as possible. All health professional practice helps students develop their professional identity and, in addition, they should be encouraged to consider the nature of an interprofessional identity [5].

It is important that students are prepared for the hidden curriculum: what students learn from observation, institutional cultures and role models [31]. After any potential interprofessional activity students should be debriefed, if feasible, about

what they have observed and learnt, have time and space to discuss the type or lack of teamwork in the clinical setting and be facilitated to reflect on the nature of collaborative practice and how it may be fostered in the environments in which they have been placed.

12.6 Examples of Learning Activities to Meet Curriculum Outcomes

Optimal interprofessional clinical attachments are examples of work-integrated learning (WIL) which aim to facilitate the integration of theory and practice [32]. Prior to practical attachments, students therefore require a theoretical platform to inform their clinical learning and facilitate orientation to the people working within clinical environments [33]. Feasibility is usually an issue with IPE when large cohorts of students, perhaps numbering up to 2000 across a whole university or organisation, are engaging in activities together. Examples of interprofessional activities are given in Table 12.3. Faculty need to consider the cost of interprofessional activities, and it is important to evaluate their impact in the longer term. New learning interventions are always vulnerable to cost-cutting, increasing clinical pressures (such as during the 2020 Covid-19 pandemic) and movement of faculty resulting in loss of sufficient experienced supervisors.

12.6.1 Classroom-Based Activities

As previously emphasised, classroom learning activities should be as interactive as possible, therefore the format should encourage group learning. Examples of well-established pedagogies include problem-based learning (PBL) and case-based

Table 12.3 Examples of interprofessional learning activities to involve two or more different health or social care professions

Classroom/online	Hospital-based	Community-based
Case-based learning	Observation/shadowing of health professionals	Observation/shadowing of health professionals
Team-based learning	Participation in team-based meetings	Community-based projects
Problem-based learning	Interviews of patients/clients on wards/in clinics	Home visits to interview patients/clients
Lectures on health system followed by guided discussion	Student wards	Student-run/guided clinics
Health care team challenge type activity	Hospital-based clinics	Longitudinal clinical placements
Simulated team-based scenarios		
Online scenarios and discussion boards		

learning (CBL), which involve learning in teams. However, team-based learning (TBL) is a term used to define a specific type of blended learning that does not have the same resource implications nor structured approach as PBL. In TBL one facilitator works with several groups of students in one classroom—each group having between five and seven members. The groups self-manage and work as teams to solve problems that should foster complex reasoning and ensure constructive debate [34].

PBL and CBL are specifically underpinned by patient case histories or scenarios, which provide triggers for learning. Patient or community cases and their narratives help link theory to practice [35]. Skilled interprofessional facilitators are required, who do not necessarily need to be content experts. Ideally, there would be two facilitators from different professions however this may not be logistically possible for many institutions. Depending on the timing of the group learning, not all students may be familiar with the type of active learning required. Orientation to the approach is necessary. The mix of cases should ensure relevance to all professions involved and include examples of interprofessional approaches to teamwork to prompt discussion. Scenarios for CBL and PBL are not easy to write and they should be developed by groups of interprofessional educators. The prime difference between CBL and PBL is that with the former learning outcomes are explicit whereas for the latter students define their own learning outcomes [36]. There is evidence that developing patient care plans within an interprofessional team reasoning framework in conjunction with video examples of interprofessional interactions helps improve students' team skills and case presentations [37].

12.6.2 Learning Through Simulation

Simulation may be anything from classroom-based activities including participant role play (low-fidelity) or working with simulated (standardised) patients, through to medium-fidelity simulation in clinical skills centres with inert models (mannikins) and basic simulated clinical settings (wards, clinics), and on to high-fidelity clinical simulations with supporting technology, programmed manikins and multi-bedded wards. The more sophisticated the simulation, the more costly and resource intensive the activity. Examples of interprofessional simulation include students interviewing a simulated patient; the management of a deteriorating patient (a simulated patient or manikin); handover of a patient from one team to another; a simulated ward. Simulation allows students to work together in a safe environment, stop and start as necessary when rehearsing skills (repetitive practice), rotate leadership and professions involved and learn effective time management and delegation. Simulation is an attractive approach as it can be designed to closely resemble practice and conditions can vary to suit learner needs [38]. The debrief and reflection after any simulation activity are crucial to enable students to express any concerns, discuss interprofessional interactions, ask questions of each other to elucidate roles and address any misunderstandings and to defuse conflicts that may have arisen. A recent review of interprofessional learning through simulation involving nursing

students and medical students indicated that the focus is mainly on communication and collaboration between these two professions but that further work is required to explore whether such activity improves the clinical capacity of the learners in the future [39].

12.6.3 Interprofessional Learning Through Clinical Practice

It is the nature of health professional education that all students undertake some form of clinical rotation with real patient contact. If an interprofessional curriculum needs to be overlaid on an existing programme, then interprofessional educators may map clinical exposure across schools to find out when students from the different professions overlap in time and space. If there is the luxury of having dedicated time for all students in a curriculum for formal IPL, logistics are easier. However, it is important for students and clinical educators to be aware that not all students will be able to have the exact same clinical experiences. Clinical education should however be equitable, and students should be given the opportunity wherever they are to meet the learning outcomes of their courses. For interprofessional learning, observation of healthcare teams in action is necessary but not sufficient: students need to become members of teams and experience complex tasks and boundary challenges, where boundaries are defined as 'interfaces, clear dividing lines between different areas of ownership or shared areas of contact' [40]. Situated and experiential learning is enhanced through continuity of location and supervision particularly in longitudinal integrated clinical placements [41].

Students may observe their own and other professions working in hospitals, clinics and community health centres. Passive observation should be limited as students get bored and their concentration wavers. However, observation if partnered by facilitated reflection [42] and actively processed becomes integrated with wider professional learning of health professional roles, responsibilities, constraints, expertise, hierarchies and models of practice [8]. Interprofessional shadowing needs structure and follow-up activities to increase the chance that learning outcomes will be achieved and integrated in subsequent professional practice.

Active learning occurs through students working in interprofessional teams under the supervision of qualified practitioners in a service-delivery setting. Two important approaches are interprofessional training wards (IPTW) and student-run clinics (SRC). The literature on these activities is expanding and indicates that students retain strong and largely positive memories of this IPE.

IPTWs began in Sweden nearly 25 years ago with the first examples being orthopaedic surgical wards (specifically for patients following total hip replacements). Patients and students are highly satisfied with the experience. Students' stereotypical views of other professions change during the experience [43]. However, this type of ward is difficult to implement in many jurisdictions depending on the legal and bureaucratic requirements within a country's health system. In addition, they are resource intensive; and it may be difficult to provide adequate time on a ward for each health profession and learner.

SRCs in the USA were originally devised to provide free access to health care for uninsured and underserved populations. In countries with universal health care access they are also referred to as student-led or student-assisted clinics. In such clinics, students from a wide range of health professions work under appropriate supervision. One systematic review indicates that SRCs give students 'the optimal and most realistic form of learning by doing' [44]. However, careful attention needs to be given to liability insurance and sustainability.

The health care team challenge (HCTC) straddles classroom and clinical locations. It is a team competition held annually at many universities worldwide. The student team is allocated a patient with complex needs and develops a management plan preferably in partnership with the patient. The team is judged on its presentation and reflection on teamworking [45].

12.6.4 Online and Virtual Learning

It is possible to provide rich interprofessional learning activities online. The interactions may not be ideal, but e-learning overcomes some of the logistical challenges of getting a mix of professional students into one place [46]. During the Covid-19 pandemic, many educators have had to grapple with the loss of face-to-face contact time and adapt to new ways of working. Institutions have shared their online resources and the interprofessional community rose to the challenge of distance collaboration as did many clinicians and patients.

Online collaborative learning activities may be synchronous, with students working together in real time, or asynchronous when they respond to discussions at times suitable to the rest of their programmes. CBL can take place online through discussion boards or chat rooms, groups may work by videoconferencing on one of the suitable platforms, and social media-supported discussions and simulations are also possible. Attention needs to be given to the type and level of moderation and facilitation, and the optimal number of students in any one online activity. In addition, some institutions may have access to virtual world technology though this may be restricted to a limited number of students. The virtual learning spaces provide computer-based simulations in which participants create a personal avatar.

12.7 Assessment of Interprofessional Learning

Assessment is no less important in for interprofessional learning than it is for health professional education in general. Assessment helps learners and teachers check whether learning outcomes have been achieved and is part of the evaluation of whether a program is effective in promoting learning. To underline the importance of interprofessional education and collaborative practice appropriate assessment activities are required.

In 2016, an international working party group consisting of 75 contributors from 15 countries published the 'International consensus statement on the assessment of

interprofessional learning outcomes'. [47]. The statement advises that assessment is necessary 'to meet the needs and expectations of patients, clients and communities, as well as carers and families, for effective cooperation and interprofessional communication between health and social care workers' (p. 4). The consensus is that assessment of learning should be 'situated and contextualised' with students being examined individually and within a group or team setting. In addition, ideally the assessors should be from more than one profession. However, national accreditation bodies may stipulate that students should be assessed summatively for licensure purposes by a member of their own health profession. While assessment of interprofessional competencies, logically and ideally, should be formulated around team working and collaboration, in reality students' achievements are typically examined at the individual level in their later years.

Assessment is frequently referred to as either formative or summative. Formative assessment during a student's program of study indicates the learner's progress and helps the learner and educator identify areas of strength and weakness. This type of assessment has been defined as 'assessment for learning'. It should facilitate a feedback dialogue and a set of interlinked activities between learner and teacher to better equip learners to learn further [48]. Summative assessment takes place at the end of a module or program. Its purpose is to decide whether a learner has achieved the standard set to pass or graduate and/or be professionally licensed. Summative assessment has been defined as 'assessment of learning', though ideally it should also be formative.

As with uniprofessional assessments, interprofessional assessments should be valid and reliable. During development it is important to remember that they should also be feasible (is this assessment possible for this large cohort of students?) and acceptable (do learners feel this assessment is fair?). As we know, teams take time to function, and a 'team' of students formed specifically to be assessed for their collaborative skills is unlikely to function well [49]. Yet, we do examine student teams formed for the purpose of the assessment, such as with an T-OSCE (team observed structured clinical examination) [50] or iOSCE (interprofessional objective structured clinical examination) [51]. What is being assessed here is the ability of students to perform a defined task as a new team; appropriate tasks for this type of assessment are responding to a cardiac arrest and care of the deteriorating patient. There are also instruments that may be used for observation and assessment over longer terms frames, for example, the interprofessional collaborator assessment rubric (ICAR) and the interprofessional teamwork and observation and feedback tool (iTOFT). These two instruments and many others are available from the National Center for Interprofessional Practice and Education at https://nexusipe.org/advancing/assessment-evaluation.

There is a growing interest in programmatic assessment which consists of combining a range of methods, including less than perfect instruments, into on-going assessment throughout a program, where the combination is more important than the quality of the components administered individually [52]. Interprofessional competencies are, therefore, not judged by a one-off observation but rather over a longer time frame. One approach is via an interprofessional passport or portfolio.

Students are given the list of interprofessional competencies or learning outcomes they need to achieve during their program of study. The institution provides suitable opportunities for students to learn, such as the activities listed in Table 12.3, many of which can have a grade or narrative mark. Students provide evidence of learning in the portfolio such as work-based assessments (WBA), for example, multisource feedback and team observation tools, peer assessment, rotation grades and reflections on how they know they have learned and what they have learned [53].

12.8 Supporting Institutional Delivery

Dimension 4 of the 4D framework focuses on how a university's specific structure and local culture shape the design and delivery of the curriculum. Important factors to support the interprofessional curriculum are dedicated funding, shared institutional vision, faculty development of facilitators capable of working with a range of health professional students, an adaptable timetable, working around logistical issues and early attention to planning for sustainability. The university needs to consider whether a dedicated department of interprofessional education is required or whether faculty should be spread through each health professional school or college. Barriers to the implementation of IPE occur at three levels (government and professional, institutional and individual) and include but are not limited to different accreditation requirements; limited leadership support and financial resources; faculty attitudes; lack of recognition for faculty who engage with IPE and turf battles amongst the professions [54].

12.9 Conclusion

Curriculum development for IPE should follow the same principles of good practice as for any other field of learning. There are added complexities as learners come from two or more health professions and class sizes may be large. The definition of, and agreement on, learning outcomes are important. Learning activities should be appropriate for the defined outcomes and assessment should be for learning as well as of what has been learned.

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