

Scale of community centre: Clarification of the relation between scale and multifunctionality of community buildings

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ARTICLE INFO

Sent: Jun 8, 2021

Accepted: Jul 26, 2021

ABSTRACT:

Community architecture is becoming a contributing tool for community development. In recent years it has gained popularity for its potential to encourage interaction and strengthen community ties. Community architecture represents not only the final product of architectural design but also the design process. It covers many kinds of community interventions and efforts of different extent; from tiny public space interventions to a complex design of community centres or comprehensive urbanistic structures focused on community well-being. Irrespective of the scale, their goal is the same; to provide space for leisure activities, networking, and reinforcing a sense of community. The most apparent design concept representing community architecture is the community centre, which provides space for meetings and interaction, and its program derives from the needs of a specific community. Furthermore, the design considers urbanistic relationships, architectural appearance, materials, spatial and functional requirements, interior design, equipment, and furniture solutions. The community architecture theory is an under-explored phenomenon in Slovakia. Thus, there is a lack of methodical design recommendations or guidelines for designing community centres as individual typological forms. The article focuses on the examination of 100 selected community facilities, identifying their prevalent features and their interrelationships. Presented research aims to examine fundamental characteristics of community centres, particularly their multifunctionality related to the character of the space, and the scale related to size in square meters. In conclusion, research suggests new size categories considering the relationship between the two factors.

KEYWORDS:

community centre, community architecture, scale, multifunctional, design guidelines

INTRODUCTION

The study of 100 community facilities examines multiple characteristics of the design solutions. Research into scale and multifunctionality is part of the author's dissertation thesis titled Community Centres ("CC" or "CCs"). This article focuses on one of its three research parts and draws attention to the relationship between the scale and multifunctionality of the community centres.

The theory of community architecture and community buildings is an unexplored research phenomenon, even though there are increasing numbers of such a building type in practice. The theory introduction is the main content of the previous article of the writer. [1] With listed examples of executed Slovak designs and basic categorization, the paper provides introductory knowledge of community architecture. Thus, this article focuses on community centres more in detail.

Even though many community centres' characteristics are directly related to the specific needs of a particular community [2], there are repetitive features identifiable through research of completed projects. For example, when designing a public facility, including those for communities, their inclusiveness is essential for providing access to all without distinction. [3] There is also a valid need for adaptability of the concept. Adaptability means the capability of the building to respond to an ever-changing evolving society. It provides the ability to fulfil different requirements of a growing community. There are also other in-depth research possibilities for community architecture through methods of community psychology [4] or neuroarchitecture [5]. The study of 100 executed projects brings a better understanding of the community building concepts and helps us identify patterns in designs and comprehend essential architectural and spatial relationships. Those can be combined (using a method of best practices recognition) into methodological recommendations for further designing.

This paper focuses on the study of the relationship between community centre scale and its multifunctionality. It clarifies the dependence between spatial possibilities and different sizes of facilities, confirms the hypothesis, but brings a new perspective on the categorization of community centres.

THE PRESENT STUDY

The present study examines the categorization of community centres. It reacts to the study *Multifunctional space related to the scale of community centres. From merging-concomitance to polyvalence-adaptability* [6] which discusses the definition of multifunctionality and its three types, altogether with scale categories classified according to the area (sqm) of the centre. Current research draws initial assumptions from the mentioned study. Through complex analysis of the research sample and the comparison of findings, the research provides a new in-depth view on the issue of the scale and multifunctionality of community centre concepts.

Scale categories

According to Zamfir, the scale of the community centre has a synergic connection with other defining elements such as principles, typologies, functions, users, and community space. In her study, classification according to floor area in three scale categories is proposed as follows; [7]

S – small CC (100–1000m²)

M – medium CC (1001-3000m²)

L/XL – large and very large CC (3001 -> 15000m²).

The work concludes there is a relationship between these categories and multifunctionality of a community centre. The interrelation will be re-examined further in this article.

Multifunctional categories

Multifunctional space is an essential principle in designing present-day community centres since it epitomises rapid and continuous changes in society. The same thing applies to community centres which reflect contemporary society by responding to community needs. Zamfir writes about society as a “society of futile, rapid changes, sometimes difficult to predict, of technological progress, steadily rising” and compares it to multifunctionality representing “the unexpected, the anticipation of non-anticipating future”. [8] In her research, three types of multifunctional space are specified: [9]

Merging-concomitance

It represents multifunctional community centres that function based on agreed scenarios according to community needs. The functional-spatial structure is predetermined by design. In quantity, specialized spaces for specific functions (e.g., canteen, sports hall, administration) prevail over multipurpose spaces with changeable usage. This type of spatial organization within a building can be classified as *polyfunctional*.

Polyvalence-adaptability

This type of multifunctionality is attained by eliminating the pre-determination by space. The aim is to bring flexibility in use and provide spaces promoting interaction. It can be achieved by designing open and loose space, by a different organization of furniture, using movable walls, or other items allowing subdivision of the space. Such a *polyvalent* place can adapt in real-time to the daily changing requirements of the community or enable the conduct of multiple activities concomitantly. The usability of the space is often increased by adding a refreshment area.

Hybrid multifunctionality

This solution co-applies both of the mentioned principles. It provides predefined spaces for specific types of activities and functions altogether with multipurpose rooms, which can morph, change scale, and adapt. In the case of *hybrid* solutions, the dominance of one of the types is not preordained. Multipurpose rooms can be the core of the centre in one design project, while in another they can serve as additional space increasing the usability of the building in time.

HYPOTHESIS

The present article verifies the premise about the direct relationship between scale and multifunctionality of community centres. The goal is to endorse this generalized finding while bringing a better understanding of scale categories.

The character of space and its multifunctionality is determined by many other factors. There is a natural influence of investors providing finances, a contracting authority, and future users dictating the desired functions and spaces. The size of the facility is affected by mentioned factors too. In addition, the location of the centre within a city, catchment area, and capacity of the building are further key determinants of the building scale.

Despite the significant impact of other factors, research is focused on the relation between the two mentioned characteristics (scale and multifunctionality) only, whose direct correlation is apparent from observations. In practice, we can talk about searching for an ideal consensus between the scale and form.

METHOD

Research sample

The online search under the label “community centre” helped produce a selection of 100 facilities. The research sample consists of projects either directly named “community centres” or containing the phrase in the title, plus those with a different title but revealed under this label search category (e.g., neighbourhood centre, civic centre, cultural centre). The sample does not contain facilities with similar titles not included in label searches. The list comprises projects completed in the last ten years (2010–2020). A significant percentage of analysed projects comes from the online source archdaily.com (72x) given the most extensive descriptions and the availability of comprehensive data. The source archello.com (25x) and dezeen.com (3x) follows with projects not available on the previous web or those with lengthy descriptions.

Instruments

The basic project characteristics of facilities in the list are collected and compared to find any correlations. Furthermore, the list contains the result of community centres are divided into three multifunctional categories. This article does not elaborate

on the categorization process since presents another part of the complex research.

For the summary, the overview focuses on the completion year, location, building status, scale of the building, and multifunctionality. **Fig. 1** shows the results of the screening.

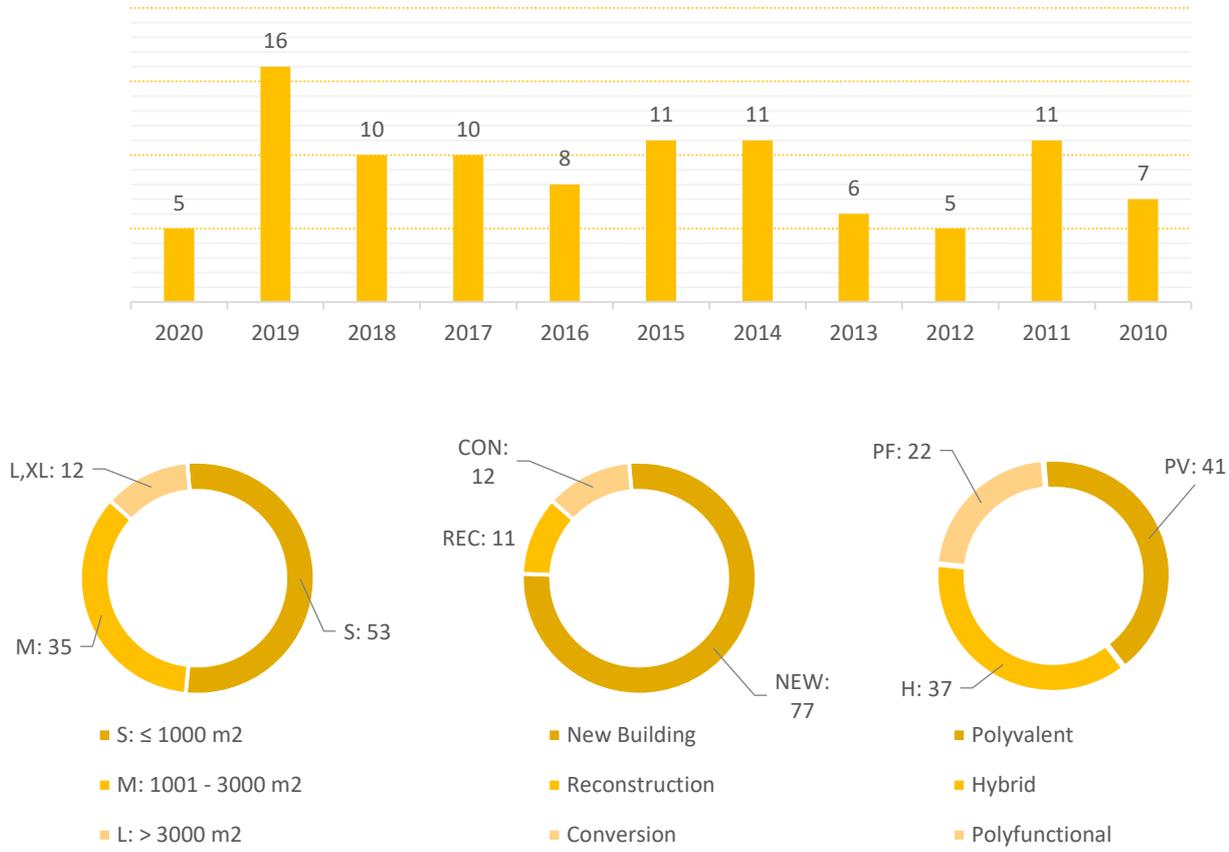


Figure 1: Results of the research sample screening. Source: Author

Year of completion

The research sample consists of projects completed between the years 2010 and 2020, inclusive. It brings an overview of the latest trends and focuses on innovative design solutions. Most of the projects were executed in 2019 (16x). The distribution of projects over the years is 5–15 projects per year without noticeable signs of growing tendency. The study of a larger research sample might indicate an overall increase.

Location

The interest in new concepts of community centres is evident all over the world. Although great examples of executed design concepts can also be found in America and Asia, the sample focuses entirely on European facilities. This characteristic relates to the state in which the project is located. Most of the projects are from France (24x) and Spain (19x). There is vast research potential for further investigation of the centres' specific position within urban areas and its interrelationship with the scale of the facility.

Building status

The created database recognizes building status, indicating whether the project is a new or renovated/reconstructed building,

or it underwent adaptation of a new function. In selected cases, community centre designs preserve the building stock and protect the historical and socio-cultural heritage of built architecture. Exceptional design quality, increased identification with a place and highlighting its significance are other benefits of alternative design approaches. Renovations, however, are challenged by many factors and might have various conflicting goals. [10] Therefore, there is a prevailing number of new centres (77x). New building structures readily meet current requirements for environmental quality, ecological sustainability, accessibility, and adaptability.

Scale categories

The centre's scale is determined by its area in square meters, which is the only quantitative variable in our research. Examined facilities were classified according to the conditions presented above. In result, the sample consists mainly of small CCs (S: 51x), followed by medium-sized CCs (M: 36x), while large facilities have the lowest incidence (L/XL: 13x). This result draws attention to the category of small centres with 50% of representatives.

Multifunctional categories

The study of the projects' space character resulted in their categorization into three multifunctional models. After deeper analysis of main categories, subcategories were introduced to avoid subjective statements. The research process leading to these al-

ternations is not presented in this paper since it is another research partial result. **Fig. 2** represents new determining information. According to the determinants, the sample consists mainly of polyvalent centres (41x). Hybrid solutions are the second most used type (37x), and polyfunctional projects have the lowest incidence (22x).

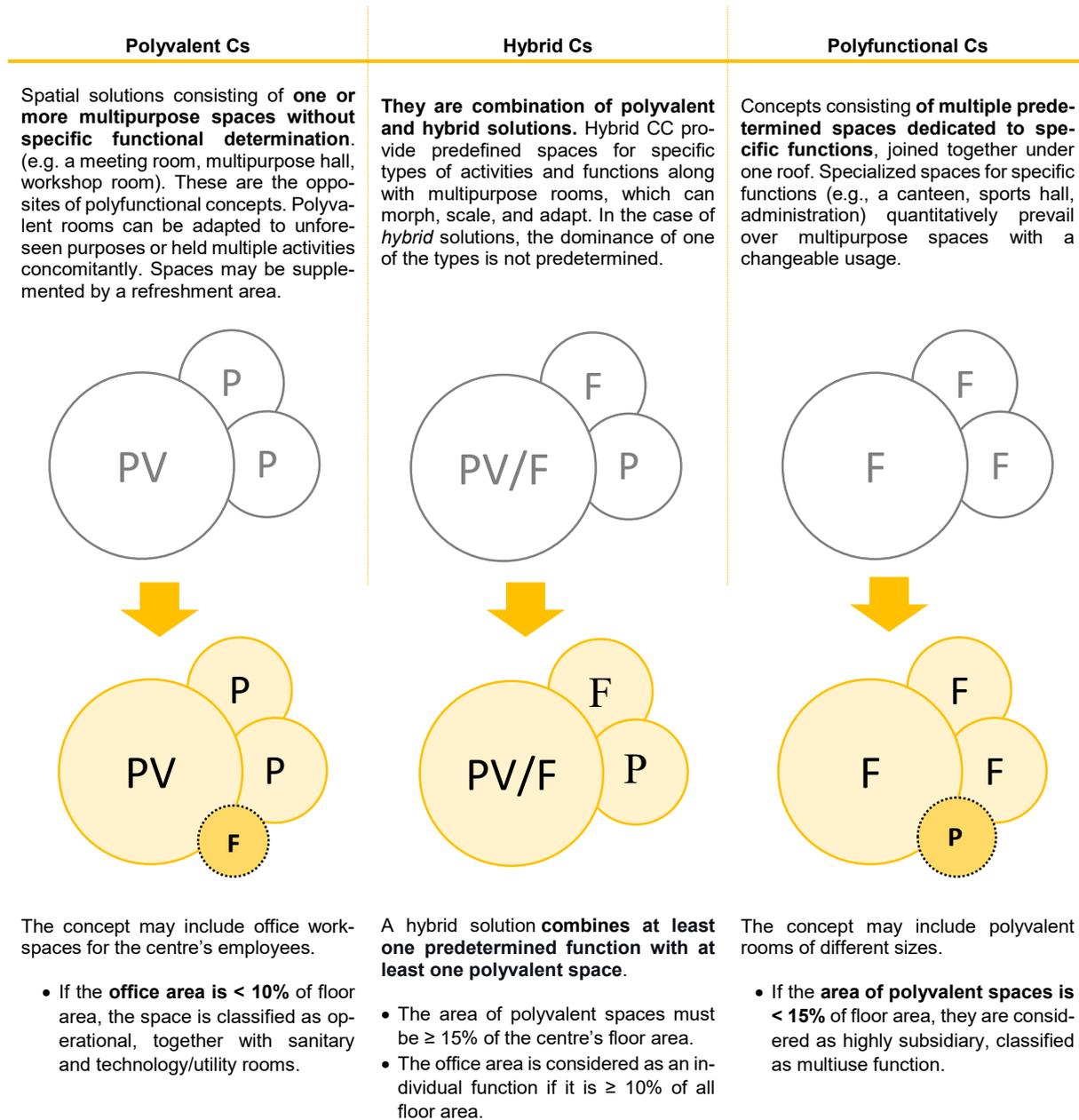


Figure 2: Extended definition of three multifunctional types. Source: Author

Procedure

Categorizing the results helped create a complex community centre database. The information about architects, sources, and notes to each project adds further level of details. Significant correlations between the data were visible after sorting projects according to their size into size categories from the smallest to the largest. The first step of evaluation included chart compilation for each characteristic, expressing the number of facilities meeting the requirement. These numbers were then assigned to specific

size categories to identify possible correlations. The percentage calculation of combinations led to a more in-depth study of the interrelationships. This method considers a different number of representatives for each scale category since it calculates the percentage of the occurrence, not only the number of elements. For considerable characteristics and their categories, the scatter diagram was created. This chart describes the occurrence of specific elements within the axis expressing the size of the facility.

STUDY LIMITATIONS

The current study is limited by the information available online. The size and scale category of the community centre determined by data provided by architects may be inaccurate, as inconsistencies in the calculation of the building area could have occurred. There was also a lack of drawing documentation provided with respect to few projects, so the specification of spaces was not possible. Projects without complete documentation were eliminated from the research sample and not included in the final evaluation.

RESULTS AND FINDINGS

Research into all characteristics resulted in two significant findings related to the scale, building status, and multifunctionality. Other characteristics as location and year of completion are not relevant.

Non-correlation of scale categories and building status

Research did not confirm any relationship between the scale and status of the building. However, **Fig. 3** verifies the dominance of

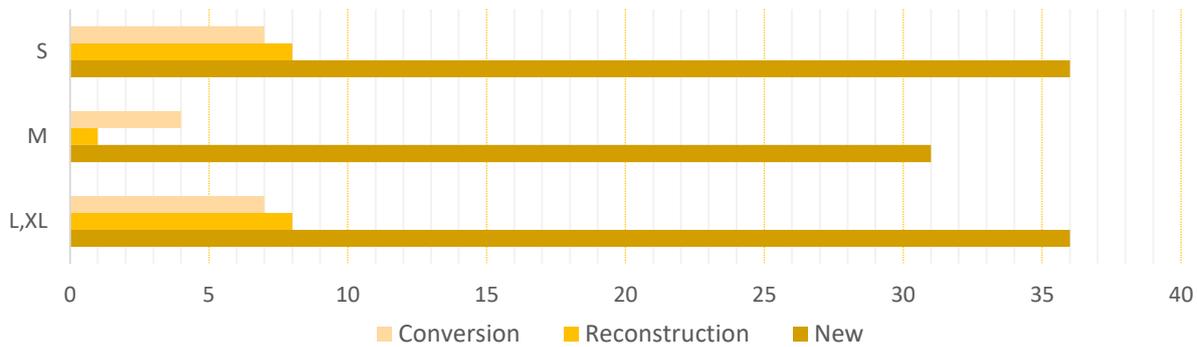


Figure 3: Examination of non-correlation between scale and status of the building. Source: Author

Table 1: Scale and status correlation. Source: Author

	N—new status		R—reconstruction		C—conversion		Total
	Qty	%	Qty	%	Qty	%	
S	38	71.70	8	15.09	7	13.21	53
M	30	85.71	1	02.86	4	11.43	35
L, XL	9	75.00	2	16.67	1	8.33	12
Total	77		11		12		100

Qty = number of facilities meeting the selected condition of scale and status of the building
 N, R, C = building status (new building, reconstruction, conversion of function)
 S, M, L, XL = scale categories according to area (m²) of the facility

new community buildings over reconstructions and conversions. The relationship between the two was impossible to identify due to the significantly smaller sample of these alternative design approaches. **Tab. 1** shows that the research sample has the highest incidence of newly built community centres.

Correlation of scale categories and multifunctionality

According to **Fig. 4**, there is an evident relationship between centres' scale and multifunctionality supporting the research premise. **Tab. 2** confirms the incidence of *small polyvalent centres* with 60% of all small centres. The 66% polyfunctional centres within large categories endorses the popularity of *large polyfunctional centres*. Moreover, there is no sign of a small polyfunctional centre at all.

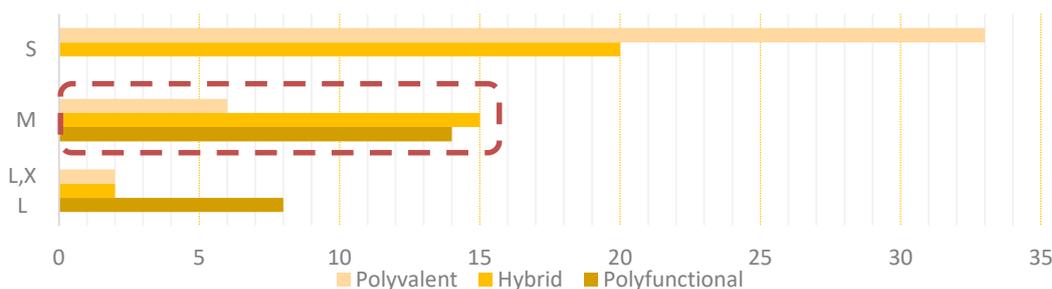


Figure 4: Examination of correlation between scale multifunctionality of the building. Source: Author

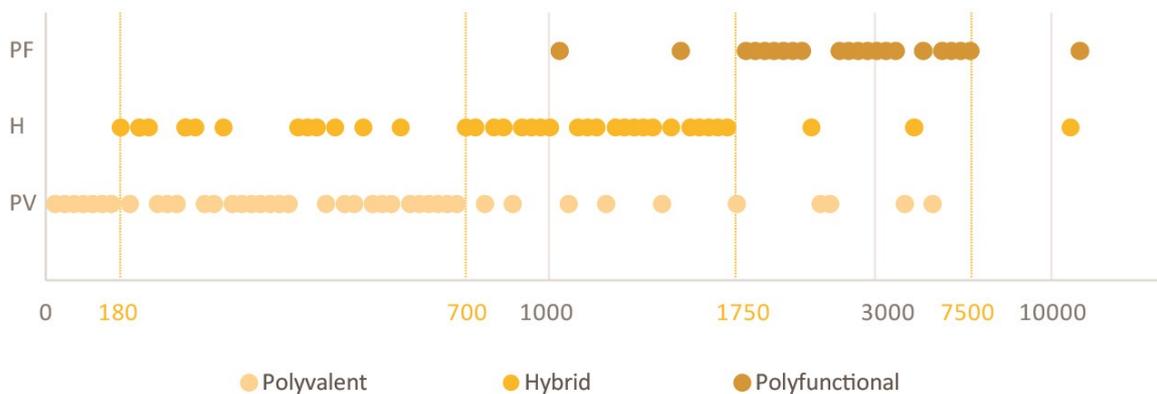
Table 2: Scale and multifunctionality correlation.
Source: Author

	PV—polyvalent		H—hybrid		PF—polyfunctional		Total
	Qty	%	Qty	%	Qty	%	
S	33	62.26	20	37.74	0	0	53
M	6	17.14	15	42.86	14	40.00	35
L, XL	2	16.67	2	16.67	8	66.66	12
Total	41		37		22		100

Qty = number of facilities meeting the selected conditions of scale and multifunctionality
 PV, H, PF = multifunctional category according to space character
 S, M, L, XL = scale categories according to area (m²) of the facility

Less clear data related to medium-sized community centres. Even though the correlation between medium-sized community centres and hybridity is supported, the numbers are not convincing. The incidence of 42% for *medium-sized hybrids* is comparable to *small hybrids* or *medium-sized polyfunctional centres*. This ambiguous result will stimulate further research into the subject.

The scatter diagram in **Fig. 5** contains the setup of all projects. The axis x presents the size of the facility. Further, by color differentiation and row separation of multifunctional types (axis y), the visibility of relationships increased. The clusters with increased concentration of specific types indicate size margins for each. The plot highlights margin values. **Tab. 3** shows the incidence of each combination of size and type in percent.



Axis x—presents size of facility in m²
 Axis y—presents three types of multifunctionality

Figure 5: Scatter plot presenting scale and multifunctionality of each facility.
Source: Author

Table 3: New scale and multifunctionality correlation.
Source: Author

m ²	PV—polyvalent		H—hybrid		PF—polyfunctional		Total
	Qty	%	Qty	%	Qty	%	
< 180	6	100	0	0	0	0	6
180–699	25	67.57	12	32.43	0	0	37
700–1849	6	20.00	22	73.33	2	6.67	30
≥ 1850	4	14.81	3	11.11	20	74.08	27
Total	41		37		22		100

Qty = number of facilities meeting the selected condition of scale and multifunctionality
 PV, H, PF = multifunctional category according to space character
 S, M, L, XL = scale categories according to area (m²) of the facility

There are only polyvalent representatives for facilities smaller than 180m². The first incidence of hybrid solutions is associated with this value. In the range of 180–699m², the percentage incidence of polyvalent centres is still dominant with 25/37 representatives, while the rest are hybrid solutions. In this size range,

no polyfunctional concepts occur. For centres with the size between 700–1849m², the hybrid form is significantly predominant with 22/30 representative projects. There are still polyvalent forms included, and the first polyfunctional centres appear. The number of polyfunctional centres increases starting from

1750m². The end size value of the cluster is 7500m². There are 20/27 polyfunctional centres within this range. The research sample contains two projects larger than 10000m².

As a result of the research, size categories were altered according to new findings. **Fig. 6** visualises the incidence of three multifunctionality types within these new categories and serves for comparison with previous setup.

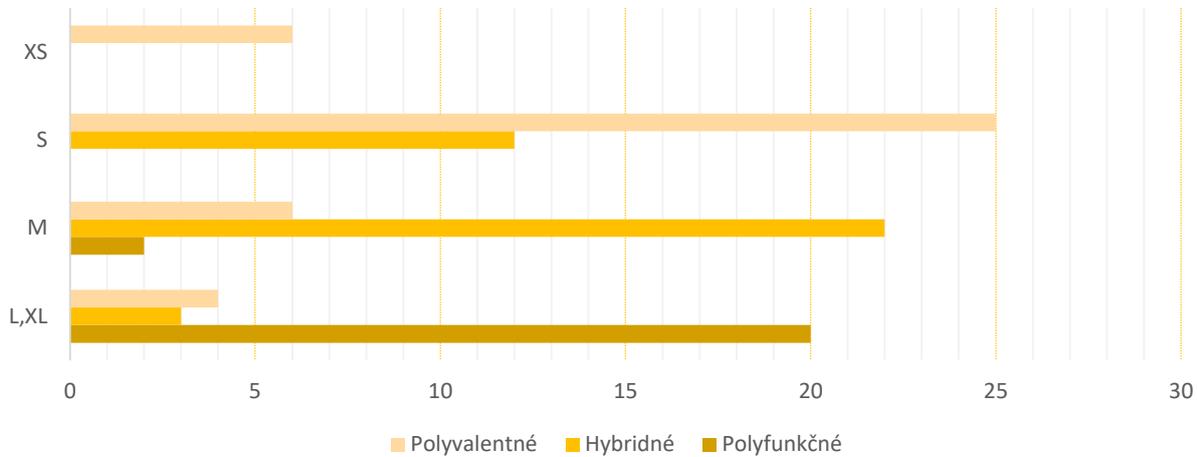


Figure 6: Re-examination of correlation between scale and multifunctionality of the building. Source: Author

RECOMMENDATIONS

Learning through best practices helps us better understand new concepts. The apparent relationship between scale and space possibilities was confirmed by the research and quantitatively described. As a result, this study proposes a *new scale classification* of community centres, expressing their relation to spatial solution and multifunctionality type better.

Redefining scale categories

New scale division emerges from the complex study of 100 executed community centres and may serve as a size guide for new designs. **Fig. 7** compares original categories used as the basis of the research to new ones. Moreover, it shows the optimal type of multifunctionality, which can be provided within selected scale of the building.

Scale categories (m ²)	Scale categories according to multifunctionality (m ²)
S (≤ 1000) = PV+H	XS' (< 180) = PV
M (1001–3000) = H+PF	S' (180–699) = PV+H*
L, XL (> 3000) = PF	M' (700–1849) = H+PV*
	L' (1850–7500) = PF+PV+H*
	XL' (> 7500) = PF+H

*type occurs within category with lower representation

Figure 7: Redefining of scale categories according to research results. Source: Author

XS' – very small CC (< 180m²)

Polyvalent solution best enables multiple uses of small areas. It provides an adaptable place for unforeseen events. The flexibility of the space is achieved by movable furniture (**Fig. 8**), partitions, seating systems, and platforms.



Figure 8: Brixton Windmill Education & Community centre (155m²), United Kingdom. Architects: Squire & Partners (2020), photo: Jack Hobhouse Source: <https://www.archdaily.com/947518>

S' – small CC (180–699m²)

Polyvalent forms are most typical. These consist of one or more polyvalent rooms, possibly supplemented by refreshment area, administration, sanitary and technology/utility rooms (**Fig. 9**). In some cases, hybrids with expanded administrative zone for a city council, social services, or non-profit organizations occurs within this size range.

M' – medium-sized CC (700–1750m²)

Hybrid solutions are characteristic of medium-sized community centre designs. It best meets requirements of connecting specific function demanded by community with polyvalent community space (**Fig. 10**). Moreover, the spatial dimensions still allow solemnly polyvalent concepts as well as invite to think of polyfunctional layouts.

L – large CC (1751–10000m²) and XL' – very large (> 10000m²)

Polyfunctional centres are typical for large concepts. However, the smallest polyfunctional facility has 1050m². Research shows the significant tendency of designing through a combination of functions such as a library, sports hall, cultural hall, canteen, etc. This type of centre usually offers small polyvalent rooms, but their significance is suppressed (**Fig. 11**). Large predetermined functional zones are dominant and serve as public facilities with a city-wide contribution.



Figure 10: Cultural centre in Nevers (1613m²), France.
Architects: Atelier O-S architects (2012), photo: Cecile Septet
Source: <https://www.archdaily.com/294892>



Figure 9: Youth centre The Point Ayre (410m²), United Kingdom.
Architect: Chamberlain Gaunt (2016), photo: Hufton+Crow
Source: <https://www.archdaily.com/801252>

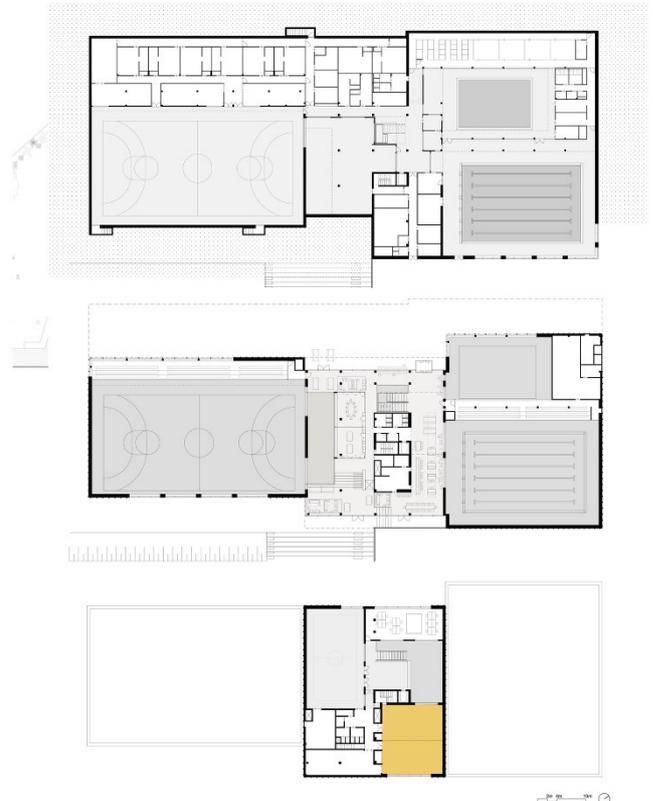


Figure 11: Multifunctional centre Doelum (7200m²), the Netherlands.
Architects: NOAHH + Studio Nuy Van Noort (2018)
Source: <https://www.archdaily.com/926658>

DISCUSSION

There is increasing popularity of community centres in Slovakia and Czechia. In comparison with Europe, the dominance of reconstructions and conversions in these countries is significant. However, the Faculty of Architecture and Design assigned two semesters of Architectural Studio II to new community centre designs for the suburbs of Bratislava. [11, 12] Research presented in this paper has not proved any significance of building status with respect to the centre's scale. Thus, the results may serve as design guidelines for further practice. There is a vast potential for multidisciplinary research of community architecture to bring further knowledge of this socio-architectural concept.

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